

'It's Important to Know In Time'

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The Newspaper of the Industry

Inside Dope

By George F. Taubeneck

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Republic Refrigerators

One hears rumors of a number of different war-goods manufacturers who are casting appraising glances at the refrigeration and air conditioning field, with the thought of postwar invasion possibilities.

Not many, however, feel up to the terrific task of trying to break into the household refrigerator business. That's a blue chip game, and they know it.

Nevertheless, we do hear that Republic Aircraft (division of Aviation Corp.) is all set to produce household refrigerators and other home appliances after the war. They have them on test now, and they are reported to have made a deal with a national merchandising organization to distribute them once the WPB gives the go-ahead signal on production to the industry. Lycoming (division of Aviation Corp.) will make the condensing unit.

Hottest Plane

Republic makes the P-47 Thunderbolt fighter plane, which is probably America's fastest fighter. As a matter of fact, with the exception of the De Havilland Mosquito, it may be the hottest plane in the air.

The all-purpose Mosquito, of course, can outfly anything, anywhere, any time.

Incidentally, Kelvinator manufactures the propellers used on this plastic plywood marvel. And Universal Cooler of Canada supplies vital equipment.

When the actual performance story of the Mosquito can be revealed, you'll be amazed.

Plenty Big

Speaking of planes, here's some dope on the Henry Kaiser-Howard Hughes cargo plane now a-building! It will have eight engines, weigh 400,000 pounds, carry 120,000 pounds of cargo, cruise at 174 miles, have a 320-foot wing spread and 218-foot length. It's all plywood. Fuel capacity: 8,000 gallons.

For perspective, compare the Douglas DC-3, the big airliner with which most of you are familiar. Gross weight: 25,000 pounds. Fuel capacity: 800 gallons. Cargo load: 5,000 pounds.

If the "HK-1" ever gets off the ground, it will be some ship! Even this monster, however, is dwarfed by planes now on the drafting boards.

Signs of the Times

In New York City, according to Charles B. Driscoll, the columnist, 60 apartments owned and managed by one bank are closed up to collect cobwebs because the refrigerators are worn out and cannot be replaced. People will not rent if there's no refrigeration.

In Detroit the WPB good-naturedly hands out hundreds of certificates permitting hopeful purchasers to go on a refrigerator hunt. Where the refrigerators are is anybody's guess. Along with each permit is issued a statement by WPB that says it is not a guarantee the purchaser will get one. It is no secret that Detroit's supply is exhausted. Want-ad sections regularly carry such items as: "Need used refrigerator, any kind. Have baby."

New Use

Army and Navy fur-lined flying suits are given first-rate care to (Concluded on Page 2, Column 1)

Air Conditioning & REFRIGERATION

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'Written To Be Read on Arrival'

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Potato Shipments Rot Without Refrigeration

Precious Food is Going to Waste

An Open Letter to Chester Davis,
War Food Administrator

Mr. Chester Davis, Chief
War Food Administration
Washington, D. C.

Dear Mr. Davis:

This is the letter I promised to write you following our conversation at the Hotel Statler Friday evening, June 11, in which we discussed the impending serious shortage of refrigerated food storage facilities.

In view of your statement that an inadequate supply of feed will force the slaughter of large numbers of our hogs and cattle this fall, the need for refrigeration will apparently become greater—and will run right into an actual reduction in the storage capacity now existing.

You remarked that "some day you hoped to encounter a simple problem." Unfortunately, this is as complex a jigsaw as anyone is likely to throw into your lap. It involves the same old factors of manpower, materials, and transportation.

Briefly, here are the reasons for alarm:

(1) Despite desperate efforts at training and replacement, less than half the nation's refrigeration service (repair) men are on hand today to cope with vastly increased calls for their time and skill. Of those in the business as of July, 1941, reliable surveys show more than 50% are in the armed forces or war plants.

(2) Difficulties in obtaining gasoline are preventing service men from visiting farms and outlying points. If a farmer needs repairs on his milk cooler, he is pretty much out of luck. In view of our rising milk needs, this situation is building into a calamity.

(3) Repair parts shortages in some categories (particularly motors, controls, valves, and tubing) are causing more and more butchers' and grocers' refrigerators to stand idle and useless, so that they cannot provide their customers with the meat, fish, fresh vegetables, and dairy products to which their ration points entitle them. This "fix we're in" is particularly unfortunate in smaller cities that do not have cold storage plants.

(4) Refrigerated transport (railway cars and trucks) is break-

(Concluded on Page 2, Column 4)

'Indoor Climate' Group Newly Organized

CHICAGO—Plans for the formation of an industry-wide cooperative educational program known as the "Indoor Climate Institute" which will acquaint the American public with the best equipment and methods for producing indoor comfort in the post-war homes of tomorrow, were disclosed here late last month by Paul B. Zimmerman, vice president, Airtemp division, Chrysler Corp., speaking before the National Warm Air Heating and Air Conditioning Assn. When the final organization of the Indoor Climate Institute is perfected as a non-profit corporation it will be governed by a group made up of individuals representing trade associations in the fields of boilers, controls, warm air heating, oil burning units, gas equipment, stokers, steel boilers and auxiliary equipment. Additional representatives at large will serve on the Board.

The Indoor Climate Institute will be supported by subscriptions from manufacturers of heating units and auxiliary equipment in the heating and air conditioning industry.

Promotional and educational plans formulated in the headquarters' office will be carried to local organizations in the key cities of the country. It is expected that the local groups will be supported by fuel interests, utilities, dealers, contractors, jobbers, manufacturers agents, and others interested in the welfare of the heating industry.

In answering the question, "Why a national cooperative program?"—Mr. Zimmerman stated that the public is somewhat confused by the many general claims made for all types of heat-

(Concluded on Page 22, Column 3)

Rinehart Buys Rights To 'Mayflower' Unit

RICHMOND, Ind.—Mayflower Products, Inc., here, headed by Brouse D. Rinehart, has purchased all the rights to the manufacture of "Mayflower" commercial refrigeration machines and air conditioning equipment from the Hardy Mfg. Co. of Dayton, Ohio and is making plans to continue production of such equipment under the "Mayflower" trade name.

In the purchase Mr. Rinehart acquired all the tools, dies, patterns, trade-marks, and patents, and all of the finished inventory. He is making plans to make genuine "Mayflower" service parts available to servicemen through refrigeration supply jobbing houses.

Mayflower Products, Inc., will have headquarters at 13 South 5th St., Richmond, Ind. A modern factory building with facilities for efficient, up-to-date operation has been acquired, and according to Mr. Rinehart, plans are being made to manufacture the "Mayflower" condensing units and air conditioners under the same model number and parts numbers as were used on previous models. A new parts and price list of genuine "Mayflower" parts will be available shortly, he declared.

Among the patents acquired, said the president of the new company, are those of a basic nature on ceiling suspended and pedestal type air conditioners and unit coolers that feature horizontal air-throw in all directions, with low velocity air delivery. A program is being developed that includes some special attention to postwar possibilities in air conditioning, he declared.

(Concluded on Page 28, Column 2)

War Council Takes Industry Shortage Of Men to WPB

WASHINGTON, D. C.—The National Refrigeration War Council met recently at the Wardman Park hotel to consider the refrigeration service problem and methods of obtaining relief.

A national educational program for men over draft age was discussed as well as methods for supplying all servicemen with standardized information in regard to reasons for deferment and methods of seeking it.

Rod Tait and Sterling F. Smith, of the War Production Board, present at the meeting, agreed with the Council that a serious condition was imminent and that no time should be lost in informing the proper authorities of the stringency of the situation. They stressed the fact that there was little definite information to work with.

Mr. Tait suggested the following action:

Keep a list of all who are in the business, but principally a list of the servicemen.

Keep this list up to date every (Concluded on Page 28, Column 1)

Nash-Kelvinator To Make Helicopters

DETROIT—Nash-Kelvinator Corp. has completed arrangements with the United States Army Air Forces for quantity production of Sikorsky helicopters, according to an announcement made here last week by G. W. Mason, president of the company.

The actual number of units involved and the location of the plant where they are to be built cannot be disclosed at this time, Mason added.

The announcement follows by only a little more than two weeks the highly successful demonstration of the helicopter by Col. H. F. Gregory of the A. A. F. Material Command Headquarters when he made 24 flights without incident using a 78 x 48 foot deck of a Liberty tanker at sea for the take-offs and landings.

Nash-Kelvinator's production will be made from designs of the Sikorsky Aircraft Division of United Aircraft Corp., of which Igor Sikorsky is engineering manager.

Lt. James Hatch, Jr. Missing in Action

HARTFORD, Conn.—Lt. James W. Hatch, Jr., son of James W. Hatch, president of Bush Mfg. Co., is "missing in action" in the African theater of war, according to notification made to the family by the War Department.

According to the information received, Lt. Hatch has been missing since April 20. He was serving as a pilot in the Army Air Forces in the North Africa area.

A member of the Yale university class of 1941, Lt. Hatch entered the regular Army in January, 1941, with the Coast Artillery. He was transferred to the Army Air Forces in January, 1942, and received his wings and commission at Luke Field, Arizona in October, 1942.

Before entering the service Lt. Hatch was active with the Bush Mfg. Co. His father is a veteran of World War I and Lt. Hatch was born while his father was serving overseas with a Coast Artillery unit.

No-Icing Rule of Gov't Results in Huge Spoilage

DISTRIBUTOR REJECTS SHIPMENT FOR NAVY

Shows What's Coming As Refrigeration Is Neglected

NEW YORK CITY—A smashing demonstration of how failure to maintain the food preserving functions of refrigeration will aggravate the nation's food shortage was made here the week of June 7 when huge parts of the potato shipments rushed into New York City rotted in transit because they were shipped without refrigeration in accordance with orders of the Office of Defense Transportation.

Shipments of potatoes were being rushed from the South into New York to relieve a "potato famine" in the nation's largest city. Purported reason for the "no icing" of cars ruling made by the ICC-ODT was a shortage of refrigerator cars.

New York wholesalers who received the shipments vehemently declared that the trouble was in Washington officialdom's ignorance about the nature of perishable foods, and the necessity for preserving them properly with refrigeration. Southern new potatoes, they explained, are as perishable as strawberries and must be properly preserved in transit.

The situation, which was only partially alleviated as late as Wednesday, June 16, puts into the glare of the spotlight of publicity the case for more attention and consideration to refrigeration facilities of all kinds if the nation's already inadequate food supply is to be fully utilized.

The "New York Times" gave front page prominence to its story of the situation in its June 12 issue, under such headlines as "Refrigeration Barred on Cars From South, Huge Quantities Arrive Badly Spoiled"—Losses 10 to 80%.

In a story under the by-line of Jefferson G. Bell the "Times" stated: "The loss of precious potatoes while the nation's food situation daily becomes more alarming is the subject of adverse comment in the food trade. Spokesmen for the food industry conceded it was logical to expect a shortage of refrigerator cars, but some of them would not agree that it was necessary to eliminate refrigeration altogether."

"The first indication of a shocking loss of potatoes was found in 'Miscellaneous Fruit and Vegetable Report No. 103' issue of Thursday by the local office of the Food Distribution Administration of the U. S. Department of Agriculture. The report on shipments from Florida and other parts of the South cited 'many showing considerable decay.'

"Inquiries made to F. H. Vahsling, wholesale produce, 127 Warren St., one of the largest potato dealers in the city, revealed that new potatoes shipped here from the South were rotting in large quantities, while potatoes (Concluded on Page 13, Column 1)

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New Questions and Answers On Order L-38 as Amended, pages 6 and 7.

What Readers Think of "Liberty, Employment, and No More Wars," pages 16 and 17.

Reports on the recent Spring A.S.R.E. meeting will be found throughout the issue.

Inside Dope

By George F. Taubeneck

(Concluded from Page 1, Column 1)
avert damage by moths.

Refrigeration equipment installed by Westinghouse in airport store-rooms kills the little animals by a shock cycle which plunges the temperature to -17° F., then raises it to 50° F. The heat hatches the remaining eggs and the larvae is killed by a second plunge to -17° F.

D'Olive & 'Rick'

A few weeks ago this column, in discussing Capt. Eddie Rickenbaker, mentioned that Nema Chairman Charles D'Olive saw Rickenbaker shoot down his first Hun. Charley has written to say that it was not Hun No. 1 he saw Rick shoot, but Hun No. 9. Mr. D'Olive flew an open-air job in Rick's squadron in France.

At the end of his letter he strikes off the following P.S.: "If you get Rick nominated for President, I'll vote for him and agree to lead all torch-light parades in my ward."

It Happened in Canada

The theme of a letter to the Department of Munitions and Supply in Ottawa from a Canadian manufacturer is so full of baffled resignation that you may recognize yourself and the crosses you bear in the following: "To achieve any degree of success,

we believe the world champion skeet shooter should be commissioned to cope with the Priorities Division since they don't stay in one position long enough for us to effect progress.

"Perhaps you would be willing to hazard a guess as to just what point we are at, but now with the added complication of the Machine Tool Controller coming aboard, the current status of our requirement is beyond our comprehension. However, we do believe we took this whole thing too seriously. You have to see the humor and forget the urgency.

"However, there is another angle which provides food for speculation. For example, medical science has established that a sound female with sufficient inclination and the patience to wait, can produce an offspring in nine months. But everything that could happen to a woman has happened to us and after seven months we can't even anticipate delivery. In conclusion, therefore, we would ask you as a matter of interest to inquire from the best authority on obstetrics what it is that an expectant mother has that we haven't got, because so far as our examination indicates, we have both been through the stages."

Austin Jones

Personnel management has become one of the most important of the newer professions in business. And it is bound to grow in impor-

tance during post-war times.

Austin Jones, Kerotest personnel manager, is one of the best; but if he ever gets tired of the headaches incident to that profession, he could do mighty well at the thriving infant photography business.

Man and boy, this department has looked at what must have been thousands of baby pictures; but Austin is currently showing the best that have ever been passed before our glazed eyes. They are of his own healthy infant, and they are really something to see.

Mission Accomplished

While we are in the flowers-for-the-living mood, we'd like to pay tribute to the Executive Committee of the American Society of Refrigerating Engineers as the smoothest-working combine of its kind we can recall in years.

We've probably sat through as many committee meetings as we've seen baby pictures, and too many of them have been largely debates of the chasing-one's-tail variety. But this is a committee that really swings into action, resolves serious difficulties quickly and logically, and winds up its agenda with decisions on every point carefully blocked out.

Headed by President Charley Logan (Superior) it includes Bill Hainsworth (Servel), John Bergdoll (York), Jack Stone (Johns-Manville), and Alf Stickney (Armour). The fact that all these men are prime wits is a great help. If the argument becomes sharp, one of them invariably turns up with a wisecrack which breaks the tension and leads to an agreement.

Open Letter to Chester Davis, War Food Administrator

(Concluded from Page 1)

ing down, as witness the "New York Times" report on June 12 that 80% of current shipments of potatoes arriving in New York from the South were unfit for use because of lack of refrigeration in transit.

(5) This year 91.7% of the nation's production of new refrigeration equipment is going to the armed forces, the Maritime Commission, and war plants. Refrigeration equipment in homes, on farms, and in food stores is wearing out at a rapid rate and cannot be replaced. Yet more equipment is needed for the produce of victory gardens, for our expanded farm output, and to prevent food wastage. In our balmy days of agricultural surpluses, spoiled carloads of food, food spoiling in stores over week-ends, food thrown away in garbage cans from homes, was of no great concern to the nation as a whole. Today it is tragic.

What does the country need to check the rapid deterioration of the food preservation situation? In brief:

(a) Deferments for refrigeration repair men on the same basis as deferments for farm workers.

(b) A nationwide recruiting and training program for new refrigeration repair workers.

(c) Adequate production and distribution of repair parts for farms, food stores, restaurants, and homes.

(d) Some production of new refrigeration equipment for farms, dairies, railroads and trucklines, food stores and restaurants, and homes.

(e) A man like yourself to bring all the manifold government agencies involved together, and push the program through.

Inasmuch as the War Food Administration is perhaps most vitally interested of all the government agencies in the preservation of food in all the various stages between producer and consumer, we hope you will bring all the influence in your power to bear on the situation. Unless preventive measures are set up now, the situation will deteriorate further to a point approaching national calamity. And much of the fine work you are doing to increase production of foodstuffs will have gone for naught.

GEORGE F. TAUBENECK, Editor

Major 'Gift' Shows Are Cancelled Following Manufacturers' Conferences With ODT

NEW YORK CITY—Cancellation of major gift shows scheduled to be held this summer in New York, Boston, and Chicago was announced following a meeting of the directors of the National Gift and Art Association and the Eastern Manufacturers and Importers Exhibit, Inc. with officials of the Office of Defense Transportation in Washington last week.

Unlike the Chicago furniture exchanges which won approval to hold summer markets from the Office of Civilian Requirements, WPB, in spite of ODT's request that all shows be cancelled this year, officials of the gift associations concurred with the wishes of ODT that their three shows be shelved this year due to war conditions.

The presidents of the two gift as-

sociations issued a joint statement which declared:

"It is widely acknowledged that these shows account for marked savings in travel but, as was pointed out by the ODT, the concentration of travel within the show period is particularly burdensome on the already strained transportation facilities. When the urgency of the situation was presented to our committee we felt that no other course was open to us but to cancel the show."

Gift manufacturers had been eager to display their new lines, it was said. On the other hand furniture manufacturers were not interested in exhibits this year, but WPB officials felt that they should be staged as an aid to the distribution of essential civilian goods.

BEHIND THE CURTAIN OF WARTIME SECRECY



.... ARE AMCOIL DEVELOPMENTS OF POST-WAR VALUE TO YOU



Until victory is won, AMCOIL Cabinets are mobilized for military purposes. And until that day when all the whistles blow, AMCOIL engineering skill and resources are at the disposal of customers supplying our Army and Navy.

Current AMCOIL developments in cold control, frozen in today's necessary wartime secrecy, will serve your industry tomorrow. They will make available strikingly improved methods of atmospheric as well as cold control. They will contribute to higher standards of accuracy.

In solving problems of high and low temperature testing, humidity testing and altitude testing, AMCOIL Engineers have gained a wealth of knowledge over and above that which must be kept confidential. Advice based on this practical wartime experience is available to help you explore your post-victory opportunities.



AMERICAN COILS CO.

25-27 LEXINGTON STREET • NEWARK, N. J.

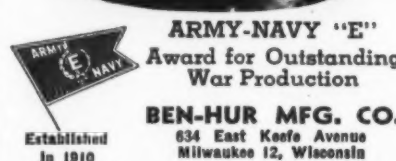
Healthful Living Through HOME FROZEN FOODS



Post-War Promise in Refrigeration

Garden-fresh, vitamin-packed foods at ANY season of the year—right out of your own HOME LOCKER PLANT... That's the BEN-HUR prophesy in post-war Refrigeration, and your greatest new-market opportunity.

But your future and ours waits today on speeding up war production, when Victory comes be ready for a NEW DAY in Food Preservation.



ARMY-NAVY "E" Award for Outstanding War Production

BEN-HUR MFG. CO.
634 East Keefe Avenue
Milwaukee 12, Wisconsin

Remember



FARM LOCKER PLANT

Another wartime message from **FRIGIDAIRE** to help dealers and users

Only 1 woman in 10 knows how!
FRIGIDAIRE
here tells you how to keep
your refrigerator happy!

If there ever was a time to give your refrigerator special care and attention it is now. Like an old friend, it cannot easily be replaced!
Care is especially important in summer. For when the thermometer soars your refrigerator works harder than ever.
No matter what make or model you have, there are many simple things you can do that will help keep your refrigerator cheerfully on the job. Here are a few pointers. There are many more in Wartime Suggestions, Frigidaire's new 36-page booklet that is yours for the asking from any Frigidaire dealer!



If it sulks

Won't run? Do this.—1. Be sure "on and off" switch (if any) is "ON," defroster switch is "OFF," and plug is in wall outlet. 2. If so, check outlet with a floor or table lamp to see if current is on here. 3. If not, check for blown fuse in distribution panel at meter. 4. If current is on at outlet, insert refrigerator plug again and try moving temperature control to the coldest position.
If nothing happens, call a service man.

Q. Do I ever have to oil and clean the motor?

A. No, if it is a sealed mechanism. Yes, if it is an "Open type" mechanism (usually belt driven). Ask your dealer what kind of oil to use, where to use it and how often. When oiling, clean and check the belt. It may need tightening or replacing. See page 27 of Wartime Suggestions.

Q. Does the condenser ever need attention?

A. The condenser is to your refrigerator what the radiator is to your automobile. Dirt and dust interfere with its cooling efficiency and increase the running of the motor. Clean with a long handle brush or vacuum cleaner attachment. Before cleaning turn refrigerator off by pulling plug from outlet. See page 26 of Wartime Suggestions.



FRIGIDAIRE Division of GENERAL MOTORS
Peacetime Builders of Home Appliances, Commercial Refrigeration, Air Conditioners



Q. Why shouldn't hot dishes go in the refrigerator?

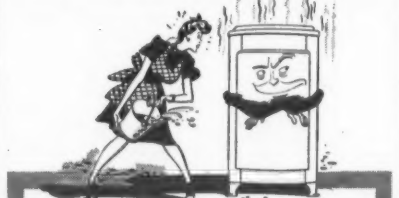
A. Let them cool first. Placing hot foods in your refrigerator may raise the temperature of the food compartment. Wastes current, too. Avoid lengthy and frequent door openings for the same reason. See page 25 of Wartime Suggestions.

Q. Does it matter how I open and close the door?

A. Yes. Always use the door handle or opener. Perspiration from your hands causes the rubber seal and cabinet finish, if non-porcelain, to deteriorate. Wash the seal frequently with mild soap and water or plain water. See pages 25 and 26 of Wartime Suggestions.

Q. Are little nicks and scratches harmful?

A. Better touch them up to avoid rust. Your refrigerator dealer can suggest the proper touch-up material, and how to use it. See page 27 of Wartime Suggestions.



If it misbehaves

Runs but won't refrigerate?—1. Remove plug from wall receptacle. 2. Defrost completely. 3. Start mechanism and check to see if freezer gets cold. 4. Repeat if necessary.

Runs too much?—1. Clean the condenser. 2. Are you cooling a big food load or too much warm food? Freezing a lot of ice cubes? 3. Temperature control may be set "too cold." If trouble persists, call a service man.

Buy War Bonds for Victory

Q. How often should I defrost my refrigerator?

A. When freezer frost gets too thick it acts as an insulator, choking off refrigeration or causing the mechanism to run more frequently. It may also raise food compartment temperatures to the danger point. Always defrost before the frost builds up to $\frac{1}{4}$ " (about the thickness of a lead pencil). For an easy way to defrost your refrigerator in just 15 minutes, see page 28 of Wartime Suggestions.

Q. What is the door seal and what does it do?

A. The door seal is the rubber gasket on the inside of the door. When the door is closed it keeps heat out of the refrigerator. The seal should be tight at all times. Check it by closing the door on a narrow slip of writing paper. If you can slip the paper up and down with the door closed on it, the seal is imperfect. If the gasket is worn out, soft and sticky, have it replaced. Tightening the latch or reversing the hinges may also help. See pages 25 and 26 of Wartime Suggestions.



If it mopes

Ice freezing too slow?—1. The temperature control may be improperly set. 2. Ice trays may not be resting flat on freezer shelf. 3. Some trays freeze naturally faster than others. Metal trays, for example, freeze much faster than rubber. 4. Trays will freeze faster in some parts of the freezer than in others. In normal operation you can speed up freezing time by wetting bottoms of ice trays before putting them in freezer.

FREE! Get WARTIME SUGGESTIONS from your Frigidaire Dealer



This valuable 36-page booklet gives more complete information about refrigerator care than can be given here. Also answers many other questions, tells dozens of ways you can make your meal-planning job easier under wartime conditions. Get a free copy now from any Frigidaire dealer. Look for his Frigidaire store sign or find his name in your classified telephone book under heading shown below. Or write to Frigidaire Division, General Motors Corporation, 471 Taylor Street, Dayton, Ohio.



Next Month: "Fight All Food Waste!"

As safeguards of health, the nation's refrigerators were never more important than they are today.

Frigidaire has taken important steps to keep them in action.

Realizing that proper care depends on the homemaker as well as the serviceman, Frigidaire has devoted a section of the popular Wartime Suggestions Booklet, now in its 5th million, to this vital subject.

Additional aid for the user is given in Frigidaire's advertising messages. The one shown here is particularly timely and helpful because it appears when hot weather breaks and refrigerator burdens increase.

Continuous service program

More than a year ago, Frigidaire introduced a comprehensive program to help dealers secure, train, and retain service manpower. This program has been welcomed everywhere. To date it has involved factory-conducted schools, field-conducted meetings, night schools, training films, a self-training manual, and a correspondence course which is the most successful in Frigidaire history. It has also included instructions for setting up an inexpensive service shop, and tips on how to conserve vital material by repairing instead of replacing.

All of these things, backed up by strategically located stocks of necessary parts for repair and maintenance of the millions of Frigidaires in use, are helping the dealer meet today's needs and helping the user get longer life and better wartime service from her refrigerator.

This timely, helpful message will appear during June and July in Life, McCall's, Woman's Home Companion, Ladies' Home Journal, Good

Housekeeping, Better Homes and Gardens, American Home, True Story, Farm Journal and Farmer's Wife. More than 27 million circulation!



FRIGIDAIRE Division of GENERAL MOTORS

Peacetime builders of Home Appliances, Commercial Refrigeration, Air Conditioners

'Pre-Built' Replacement Assemblies Speed 'Breakdowns' Back In Operation

Old Parts Used To Build Up 'Loaner' Systems

MONTGOMERY, Ala. — Valuable time in restoring important government refrigeration and air conditioning to service is being saved at Nolin Bros. Refrigeration Co., commercial refrigeration service organization here, by the use of "prebuilt assemblies" of all parts.

Nolin Brothers since the beginning of the war have been steadily accumulating all the old refrigeration parts and equipment possible, including many used compressors and coils which were slated for the scrap pile otherwise. By dint of hard work and exhaustive parts-reconditioning work, they have been able to put most of these to practical use.

Instead of storing parts in bins in the shop, however, the concern has found it wise to build all of them into complete compressor units, coil units, etc., of various sizes, ready to be placed in operation on a moment's notice. In all cases, these pre-built assemblies, which may cover any part of a commercial refrigeration or air conditioning system, are put together with brand-new bolts and lugs, well greased, which makes it easy to remove any mechanism or part if necessary.

For example, if it is found that an Army walk-in cooler needs only a new condenser, and the only available

one has been prebuilt into a complete unit, it takes only a few moments to detach the condenser and rush it to the job.

"We're willing to do this," B. Nolin, one of two brothers who head the firm, said. "But we've found that it is seldom necessary—usually the important thing is preventing the spoilage of large quantities of food or dairy products, and if we can solve the problem by simply replacing the refrigeration unit, everybody concerned is pleased."

In a large parts stock room at the rear of the plant (which formerly built tailored coolers for commercial users) Nolin Brothers keep up a large stock of compressor units from half-horsepower up to three and five ton types. As soon as an old one is removed from a job, it is repaired and put back into stock—the customer being charged the standard rate as if the repair work was done "on the spot."

In some instances, the replacement compressor is sold outright, but for the most part, interchanging of the rebuilt unit for the broken-down old one is simply a continuous process. Many units, of course, are used up in converting old meat display cases into frozen food storage plants or farm refrigeration boxes.

Lindsay and Lindsay Take New Plant

CHICAGO—To meet increasing demands for Lindsay Structure for war equipment, Lindsay and Lindsay, 222 W. Adams St. here, have purchased a new plant at 4818-4833 S. Rockwell St., Chicago.

Manufacturing was moved to the new building June 15 and N. R. Easter, general manager in charge of production, says that the increased manufacturing facilities will make it possible to triple the output of Lindsay Structure.

Lindsay Structure prefabricated metal housings are being used for vital radio and electrical equipment, refrigerator lift boxes, testing cabinets, and medical equipment. The Structure is also in wide use for refrigerator buildings for naval and military overseas bases.

Appointments Made In G-E Plastics Laboratory

PITTSFIELD, Mass.—Two appointments in the G-E plastics laboratory have been announced by W. H. Milton, Jr., manager of the Plastics division of General Electric Co.'s Appliance & Merchandise Department.

Dr. J. J. Pyle, former group leader in charge of research and chemical development, has been appointed chemist in charge of the plastics laboratory succeeding Dr. G. F. D'Alelio, who has resigned from the company. J. W. Underwood was named administrative assistant to Dr. Pyle.

Refrigeration and Air Conditioning As a War Production Tool

By L. W. Clifford, Sales Development Section Supervisor, Westinghouse Electric & Mfg. Co., East Springfield, Mass.

Protection and Use Of Abrasive Wheels

In the manufacture, use and storage of abrasive wheels and sandpaper controlled conditions of temperature and relative humidity can often contribute much to the production of a superior quality of product and to its longevity in use or in storage.

In the case of abrasive wheels, where the abrasive grains are bonded together by bonding compositions such as bakelite, ceramics, hard rubber of sodium silicate, it is important that the proportions of grain sizes be closely measured. While the abrasive grains themselves are not hygroscopic they must be kept free from moisture to allow accurate weighing of the grains.

Where the bakelite bonding material is also in grain form when mixed with the abrasive grains it is likewise important that excessively high relative humidity be avoided due to the hygroscopic nature of the unpolymersized bakelite.

If the bakelite is in liquid form when the abrasive grains are added the room temperature should be controlled to assure a constant consistency of the bakelite fluid.

When the bonding material is a ceramic clay, relative humidity control prevents lumping of the clay and assures a uniform mix of ceramic and abrasive grain.

In the case of wheels where sodium silicate is used as the bonding material the finished wheels are hygroscopic to a certain degree and, unless used and stored in an atmosphere free of excess humidity, deterioration of the wheel will take place due to moisture regain.

Many of the wheels in use are of the flexible type where the abrasive grains are cemented or glued to the surface of the wheel. The wheel itself is usually made of laminated

woven cotton fabrics. In the manufacture and use of these wheels, low temperature and high relative humidity cause the glue to jell and prevents proper packing of the abrasive on the wheel head.

Sandpaper, when stored for any protracted period should be stored in an atmosphere where both too high and too low relative humidity values can be avoided. If the relative humidity is too high the paper absorbs moisture and the glue is softened. In the case of too low relative humidity the glue dries out and the abrasive grains become detached, thus affecting the abrasive qualities of the sandpaper.

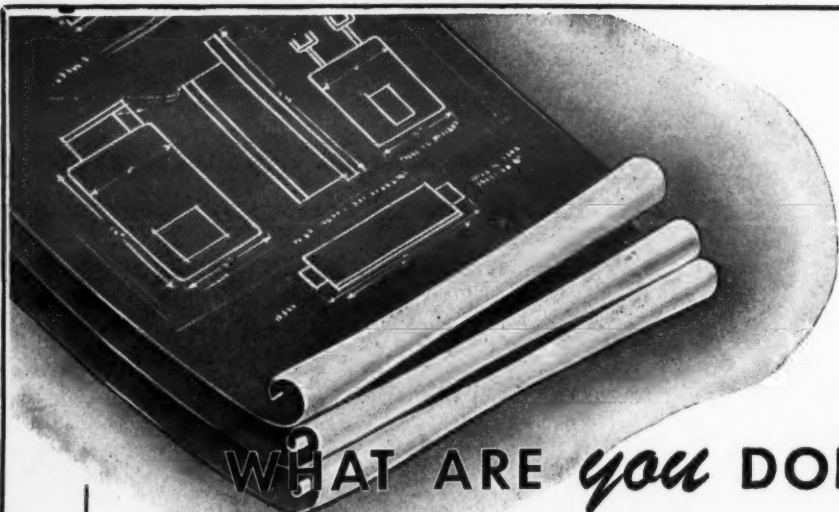
At one typical installation a 25 ton air conditioning system is being used to condition the room where bakelite bonded abrasive wheels are manufactured. The temperature is held at 78° dry bulb and the relative humidity at 50%.

This same condition, according to various authorities, is satisfactory for the various types of abrasive wheels and abrasive papers we have discussed.

Hurley Replaces Berner In Milwaukee Post

MILWAUKEE—Andrew J. Hurley has been appointed by the Electric Co., to replace Jerome Berner as contact man calling on appliance retailers in the Milwaukee area.

Mr. Hurley will take over Mr. Berner's post in the connection with appliance exchange between dealer members of the Wisconsin Radio, Refrigeration and Appliance Assn. Under this plan, all dealers cooperating furnish a central office with details regarding old stocks on hand, so that any who has a specific market for something another dealer may have in stock can "swing the deal" to mutual benefit. Regular bulletins of this type are being sent out to all appliance dealers.



WHAT ARE YOU DOING ABOUT POST-WAR PLANNING?

Practical, well-laid post-war plans are the immediate need of all industry. Many important new developments, applied through intelligent planning, will bring new efficiency and comfort to a world at peace.

If dependable temperature or pressure control is a factor in the successful application of your product or service, it will pay you to investigate the White-Rodgers Hydraulic-Action principle and other new developments in temperature and pressure control.

Because of the importance of post-war plans to American industry we have prepared a "Post-War Planning Checklist" which may be of assistance in setting up your own post-war program. We shall be glad to send you a copy upon request.



WHITE-RODGERS ELECTRIC COMPANY

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Controls for Heating • Refrigeration • Air-Conditioning

THESE CHAPS manning our battle line are right guys. For their sake, we're proud to beat production schedules, and we're trying every day to improve on even the recognized Chieftain quality of workmanship in condensing units and compressors. Practically our entire output is going to the armed forces. It's a privilege and pleasure to back up our "right guys" with the best we've got.

TECUMSEH PRODUCTS CO. TECUMSEH MICHIGAN



Chieftain

Big Step-up Seen In Home Electricity Use Following the War

Heat Raised Havoc With Both Men and Equipment at Flying Field Control Tower

NEW YORK CITY—C. A. Powel, manager of the Headquarters Engineering Departments of Westinghouse Electric & Mfg. Co., predicts a sharp increase in postwar home use of electricity, rising from the present 1,020 kilowatt hours consumption per year to 2,000 kilowatt hours consumption.

Mr. Powel, vice president of the American Institute of Electrical Engineers, made his forecast in an address at the annual meeting of the Edison Electric Institute.

New sources of increased demands for electrical power after the war, such as: greater use of pre-war electrical appliances; wider use of fluorescent lighting for both utility and decorative effect; the use of the Precipitron, an electrostatic air cleaner; all-electric, coordinated kitchens; deep freeze units; and consumers' use of television, make Mr. Powel's prediction reasonable. The anticipated increase in home consumption will not alter the present size of a home's electricity bill, Mr. Powel claims.

Distribution systems will have to be expanded and stepped up to supply the needed power for an efficient flow of electricity into residential districts. Mr. Powel suggested the use of secondary networks, underground latticeworks of electric conductors for densely populated areas, to insure reliability of service and economy of equipment. Heavier electrical loads for less concentrated residential areas could be provided by transformers connected in parallel.

Mr. Powel also prophesied that fluorescent lamps with plastic or plywood reflectors would find a great postwar commercial market. A tendency toward curved or circular fluorescent lamps will increase, and these should be standardized immediately to insure convenience in replacement, etc. Standardization of electrical equipment has already begun, offering a more economical and better product with speedy replacement.

Smaller steam turbine generator units could be manufactured in a smaller number of standard units or package power plants, which could be fabricated like a house and shipped.

Air Conditioning Eliminates Heat, Dust and Noise

GUNTER FIELD, Ala.—Before a five-ton Carrier air conditioning unit was installed in the main radio control tower here, flying training officers of the Gunter Army Air Field had about the most uncomfortable job on the field. Exposed to the hot Alabama sun in a glassed in superstructure atop a 59 foot steel scaffold, they perspired over the job of directing student cadets in the air.

Investigating means of making aviation cadet training as safe as possible, the area engineers of the field found that the practice of opening windows in the tower room had several bad effects. First, varying air pressures and dust was interfering with the accurate operation of meteorological instruments which provide information radioed to pilots

for landings and takeoffs.

Second, the noise of engines gunned on the ground, or similar sounds, was likely to distract the tower radio men who had to deal with scores of planes simultaneously.

Finally, with the hot sun raising the temperature in the control room sharply, it was difficult for the control tower crew to keep at peak efficiency.

All these drawbacks have been eliminated with the addition of the package air conditioning unit, which is suspended on a platform beneath the tower control room. Heavily insulated, and combining compressor, fan station, air washer and coils in a single unit, this has been equipped with special duct-work to bring the stream of air cooled to an exact 79°

in through a ceiling grille. There is a four-foot dead air space over this. An exhaust fan at floor level draws out the cooled air after it is circulated, keeping a continuous change of air over the radio panels at all times.

Rapid condensing is provided by the steady breeze always blowing at the tower's high altitude, passing over an enlarged condenser radiator hung beneath the unit. The unit is thermostatically controlled for 24-hour operation, and keeps the temperature inside the tower within two or three degrees of the desired temperature over this period.

Success in controlling formation and landing movements of scores of BT-13 trainers in the air simultaneously has encouraged installation of similar tower cooling plants at Graig Field near Selma, Ala., and also at Tuckeegee, Ala., at the Negro aviation cadet center there. It is no longer necessary to open windows in these radio towers, and all future structures of this type will be constructed without windows of any kind. Blued glass, capable of straining out actinic heat rays, has also aided in reducing temperature.

Baltimore Theaters Pool 'Freon' Supply

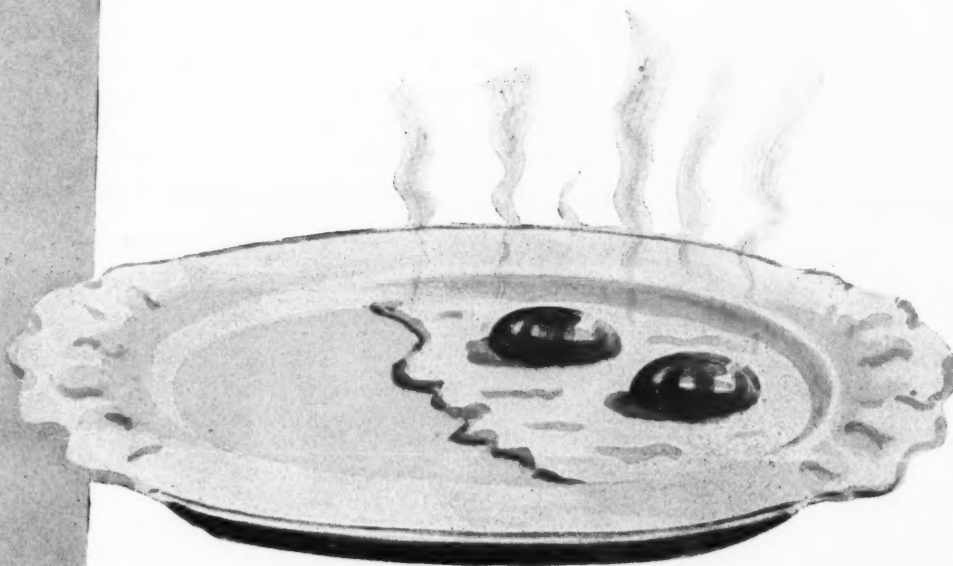
BALTIMORE—A plan to "pool" reserve stocks of "Freon" and other refrigerants has been agreed upon by members of the Baltimore Motion Picture Theater Owners' Association to assure comfortable operation of all movie houses during the summer months.

Each dealer, in view of the refrigerant shortage provoked by a scarcity of cylinders, has turned in his inventory of cooling fluid on hand and will be allowed a fair percentage from the pool to carry him through the hot weather just ahead, it is reported.

Sunnyside Packing Co. Plans Freezing Facilities

SUNNYSIDE, Wash.—The Sunnyside Packing Co. will build a quick-freezing and dehydrating addition to its plant here.

*It
just can't
be done*



WITHOUT THE HAM—NO HAM AND EGGS



WITHOUT THE CYLINDERS—NO "FREON" SHIPPED

HARD TO REALIZE, isn't it? There was always so much of everything in this country. Plenty even to waste.

But it isn't that way any more. The war has pulled a vanishing act on practically everything.

Steel, for instance. We had so much! Now there is not enough. There is no steel at all for new "Freon" cylinders.

Existing cylinders *must* do the job. There's plenty of "Freon" for all essential needs, but we can't get it to you unless you—

Return cylinders...NOW!

KINETIC CHEMICALS, INC., MAKERS OF "FREON" SAFE REFRIGERANTS

"Freon" is Kinetic's registered trade mark for its fluorine refrigerants



**Cafeteria Models
Self-contained Storage
And Remote Types**

Shipboard and Land Use

Film Processing
Bakery Service
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Brine Cooling
War Industries
All Purposes

Complying with

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AA-2 Rating Is Restored to Stop Up-Rating Pleas

WASHINGTON, D. C.—J. A. Krug, Chairman of WPB's Requirements Committee, declared June 9 that in order to avoid creation of a new "super" priority rating to care for the most urgent programs, the rating of AA-2 was recently restored by amendment of Priority Regulation No. 1.

This change provides a bracket between the AA-1 and AA-2X bands, and provides for increased flexibility in the whole structure. The AA-1 bracket is now reserved for the most pressing military production and for certain other essential needs, such as shipments under Russian Protocol and maintenance of specified production and service facilities.

WPB officials said that as a result of these changes, requests for the up-rating of programs will be reduced to a minimum, once the new rating structure is applied. They pointed out further that, under the Controlled Materials Plan, only as much material is allotted as is available at the mills, and that a manufacturer obtaining an allotment number is assured delivery of copper, steel, and aluminum, regardless of preference ratings, provided his orders are placed with mills within the time limits specified by CMP regulations.

Additional Questions & Answers on Order L-38, as Amended May 20, 1943

The following series of questions and answers on Limitation Order L-38 (industrial and commercial refrigerating and air conditioning machinery and equipment) as amended, has been issued by the General Industrial Equipment Division of WPB.

1. Does the term "system" include the following: (a) all types of evaporative coolers (b) Water coolers of the cooperation type (c) Cooling towers of the atmospheric, forced draft and washer type?

Answer: The word "system" is used to cover both refrigerating and air conditioning systems.

- (a) It includes such equipment as evaporative coolers designed for air conditioning purposes. There are a number of types of apparatus used merely for the transfer of heat from one substance to another, however, which are not included by the definition. These usually consist of pipe, tubing, or other apparatus used as a conduit for the passage of the substance to be cooled, in the course of which heat is exchanged or transferred from such substance, directly into the atmosphere or into water which is not artificially cooled, and without the use of any other cooling or refrigerating equipment or machinery.

Among the types of apparatus sometimes used in this manner, and which are not within the definition of "system" when so used, are the following: Oil quenching equipment, shell and tube coolers, transformer oil coolers, generator cooling coils, and radio tube coolers. The pipe or tubing previously referred to may be sub-

jected to a water spray or exposed to water not artificially cooled, which aids in the dissipation of the heat, but this does not bring the apparatus within the definition. For example, some of these types of apparatus used on boats are designed to pass ocean or river water through the coolers for such purposes as cooling engine oil, and such apparatus is not within the definition.

- (b) Containers of the so-called "cooperage type" such as "railroad water kegs," "harvest kegs," and "water breakers" for use in life boats and life rafts, which are not used or designed for use with coils or other apparatus intended for the application of ice or refrigerants in lowering the temperature, are not within the definition of the order.

- (c) Equipment such as cooling towers of the atmospheric, forced draft, or washer type are included under Order L-38 only when such equipment is a part of a "system" as defined in paragraph (a)(1) of the Order.

2. How must the ratings be obtained for deliveries for maintenance and repair service?

Answer: Prior to the amendment of L-38 on May 20, 1943, repair parts could be delivered to the owner (consumer) of a system only for "emergency repair service" as then defined in the Order (in addition to the deliveries of repair parts permitted under "authorized orders" or for direct use by the Army and other agencies designed in (b)(1)(i)(d)). Parts may now be delivered for "maintenance and repair service" as now defined, provided deliveries are made under an Order rated AA-5 or higher.

It is immaterial whether the rating is assigned under Order P-126, under CMP Reg. 5, on a PD-1A Certificate, or in any other way. Regardless of how the rating is obtained, however, deliveries can be made only in accordance with L-38.

It is to be particularly noted that equipment which would constitute a capital addition cannot be delivered for "maintenance and repair service" even though CMP Reg. 5 permits the use of the ratings assigned by it for capital additions of a limited amount. Even though ratings for such capital additions may be assigned under CMP Reg. 5 or otherwise, it is still necessary to secure an "authorized order" for their delivery to be permissible under Order L-38.

3. Is a delivery to be considered as made "to and for direct use by the Army, etc. . . ." or other designated agency when the equipment is to be used by a private contractor? If it is to be purchased from company or squadron funds?

Answer: Several provisions of the Order restrict deliveries, with an exception provided for cases where the equipment is "to be delivered to, and for direct use by" the Army or other designated agencies. Such an exception applies only where the Army or other agency purchases the equipment, and for direct use by its own regular personnel or regular employees. Not excepted are deliveries made to persons other than the designated agencies, even though the equipment is to be purchased from company or squadron funds, or the like. These are not purchases by the "Army." Neither are deliveries made to such an agency excepted where the equipment is for use by its contractors, or by persons who are not regular personnel or regular employees of the agency. For example, the delivery of a walk-in cooler to be used by a university which is furnishing classroom facilities for training "WAVES" and having university employees serve meals, would not be excepted.

4. Are the provisions in subparagraph (d)(3)(ii) permitting "producers of replacement parts" to "schedule their production of replacement parts as if the order therefor bore a rating of AA-1" extendible to a supplier or subcontractor? Or may the provisions of this subparagraph only be brought to the attention of a supplier or contractor who in turn "may" "schedule their production" of the part or parts on order with them in accordance with the provisions of this subparagraph, the supplier or subcontractor becoming, under such circumstances, a "producer" of "replacements"?

Answer: Under the provisions of subparagraph (d)(3)(ii) the schedule rating of AA-1 is not extendible by a producer to his supplier or subcontractor. The provisions of this subparagraph may, however, be brought to the attention of the supplier or subcontractor who in turn may schedule his production of replacement parts as if the orders therefor bore a rating of AA-1.

5. Until such time as Orders L-100, L-163, and L-172 may be amended to eliminate such requirements, must producer's reports, etc., as required under the terms of these Orders, be filed by a "producer" as defined in paragraph (a)(6)?

Answer: Any producer's reports, etc., required by Orders L-100, L-163, and L-172 are not eliminated by the provisions of Order L-38. Order L-38 only removes the necessity for filing several applications for the special authorization required by these Orders prior to acceptance.

6. Paragraph (b)(2)(i) of the Order states in effect that "dealer, producer, or other person may deliver (unrestricted by this Order)—, any new or used parts acquired by such dealer, producer, or other person prior to May 15, 1942, for use in any such equipment owned by him on May 15, 1942, except. . . ." Does this paragraph apply to parts other than

(Concluded on Page 7, Column 1)



THAT VITAL MIDDLE LINK

Past, present, and future are all part of a continuous chain. In postwar planning, we must turn our eyes on the future. Yesterday is gone; its goods and ways outmoded—today is war—but TOMORROW offers limitless opportunity for NEW ideas, NEW methods, NEW products.

As you plan for tomorrow, remember that SERVEL is laying the foundations for the finest and most complete line of condensing units we have ever offered in the commercial refrigeration and air conditioning field.

So we say "Get All the Facts" so that your plans may be on a firm foundation.

The POST-WAR ERA
Commercial Refrigeration
and Air Conditioning



FREE Clip this illustration, pin it to your letterhead, and mail it for your free copy if you plan to manufacture any fixture, appliance, or other device requiring cooling after the war.

"THERE IS NO SUBSTITUTE FOR EXPERIENCE"

SERVEL, INC.

ELECTRIC REFRIGERATION and AIR CONDITIONING DIVISION

EVANSVILLE, INDIANA

More Questions and Answers on Order L-38

(Concluded from Page 6, Column 3)

repair parts and may repair parts owned on or before May 15, 1942, he sold for use in equipment owned before May 15, 1942?

Answer: The term "parts" as used in subparagraph (b)(2)(i) refers only to parts (whether new or used) necessary for the installation of List A equipment such as tubing, controls, etc. It does not include new or used parts to be used for replacement purposes. All repair parts, whether for List A items or any other "system," are subject to the restrictions in paragraph (b)(1).

7. With regard to subparagraph (b)(2)(iv), can farm milk coolers be delivered, unrestricted, less coil and condensing unit?

Answer: The delivery of such farm milk coolers is not restricted by Order L-38, but is subject to the provisions of Limitation Order L-170 and the rationing procedure established by the Department of Agriculture. The coil and condensing unit may only be delivered on an "authorized order" (PD-831) to the manufacturer (assembler) of the milk cooler, unless delivered for maintenance and repair service. When assembled, the complete unit is then subject to Order L-170 (or any other order dealing with farm machinery) and the rationing procedure, and not to Order L-38.

8. Is it permissible under Order L-38, subparagraph (b)(2)(i), to deliver, without restriction, hermetic condensing unit of a capacity greater than $\frac{1}{3}$ hp.? The last sentence of this paragraph reads, "except a new refrigeration condensing unit rated at more than $\frac{1}{3}$ hp. and designed for remote installation."

Answer: Condensing units of either the hermetic or open type larger than $\frac{1}{3}$ hp. may be delivered, unrestricted, with and for use in List A items if such items are self-contained; that is, the condensing unit is incorporated within the enclosure of the List A item. If not self-contained, units over $\frac{1}{3}$ hp. whether of the hermetic or open type, may only be delivered pursuant to an "authorized order."

9. Subparagraph (b)(2)(iii) of L-38 does not mention that an authorized order is required to make delivery to the designated agency. Can these items be delivered without a rating or authorized order?

Answer: This subparagraph refers to items of equipment on List B, Part II, and if for delivery to and for the direct use of the designated agency, they may be delivered to such agency without an authorization or rating. Any rating applied by such agency will usually be on a PD-3A Certificate, although not required by L-38.

10. Does "dispensing" as used in item 16, List C of L-38, include retailing in a food market?

Answer: Yes.

11. What is meant by construction work as defined in subparagraph (c)(1)(iii) of L-38?

Answer: Refer to the definition as given in Conservation Order L-41. Paragraph (b)(2) of Order L-41 contains certain exceptions to its restriction on new construction. For example, (b)(2)(ix) exempts structures which will not require any specific authorization for material to provide electric or other designated services, under any Order in the "U" series, provided that the estimated cost of the construction is less than the amount specified for particular types of construction. By reference to paragraph (h) of Utilities Order U-1, it is found that paragraphs (h)(1)(ii) and (iii) permit additions or expansions of a limited nature to electric and certain other utility plants, without a specific authorization from the War Production Board.

If a proposed installation of a refrigerating or air conditioning system may be made, under these provisions, without a specific authorization, and if the cost of the proposed construction does not equal the amounts specified in L-41 (for example, if the proposed construction is industrial construction as defined in L-41, and the estimated cost will be less than \$5,000 over the period specified in L-41), no authorization under L-41 is required. An authorization under L-38 would be required in such case. Should the proposed construction not be exempted under the terms of L-41, however, then separate authorizations under both L-41 and L-38 are necessary, in addition to any authorization which the utility requires under U-1.

12. Do manufacturers require AA-5 or better rating to repair a compressor or unit in their own service department taking into consideration that some new parts would naturally be required?

Answer: No. The amended Order L-38 permits the exchange of a used sub-assembly of a type which is normally exchanged in assembled form in order to permit immediate restoration of the installed system to service and subsequent shop reconditioning of such sub-assembly. Therefore, if such a sub-assembly was returned to the manufacturer, he would not require a rating in order to repair it. However, such a repaired sub-assembly cannot be delivered to a person acquiring the same for use except under an order rated AA-5 or higher.

13. Should the War Production Board be communicated with in regard to applications for refrigerating and air conditioning equipment filed on Forms PD-830 and PD-831?

Answer: Yes, but allow enough time for the original application to reach the General Industrial Equipment Division and an additional 10 days for the application to be processed.



And whether or not it's a safe journey down to earth depends on the parachute, the way it is packed, the care with which it is manufactured and the quality of the materials of which it is made.

TODAY

The most rigid inspection is made of all materials going into a parachute. For instance, a sample is cut from every bolt of cloth and hung for several hours in an air conditioned laboratory where the temperature and humidity are very closely controlled. The material is then given many tests to determine its resistance to air flow, thickness, weight and tensile strength.

The completed 'chutes are then stored in air conditioned rooms, not only at the factory, but at the flying fields where they are to be used.

Thus refrigeration and air conditioning, in one more way, guard the lives of our fighting men.

TOMORROW

From America's looms and laboratories will spring undreamed of new fabrics which will not only be more beautiful, but more resistant to wear, tear and fading. In many ways these products will contribute to our comfort and health.

And, air conditioning will play a most important part in the manufacture, testing and storage of tomorrow's textiles.

Detroit Expansion Valves and Automatic Controls are operating on thousands of air conditioning and process control installations. Today, in addition to doing our bit for Victory in the manufacture of vital material for our armed forces, we are keeping pace with the important developments in the refrigeration and air conditioning fields and will be ready Tomorrow to make our contribution to the products of peace.



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Cornell Conference Suggests Changes In Design of Home Freezer Cabinets

Most Improvements Would Help User; Data Given on Home Freezing Technique

ITHACA, N. Y.—In a conference called to discuss the advent and development of the home freezer cabinet, its place in the household equipment field, and in the refrigeration industry, and to determine methods to make correct use of the cabinet in the home, the Food Processing and Research Council of Cornell University, organized about a year ago, was host to a group May 19, the conference being under the direction of the School of Nutrition and the Federal Nutrition Laboratory.

Another purpose of the meeting was to put down the ground work for consumer education in the use of the cabinet.

Some Who Attended

Executives and representatives of many nationally known refrigeration companies attending, upon the invitation of the University: C. R. Robertson, of Chrysler-Airtemp Corp.; W. F. Davidson, of Consolidated Edison Co. of New York, Inc.; Marty Ward, manager of the manufacturing division of the Cooperative G. L. F. Farm Supplies, Inc.; C. L. Reisner, sales manager for De Laval Separator Co.; Henry Steinhorst and Fred Steinhorst of Emil Steinhorst and

Sons, Inc.; A. H. Hemker, Rural Electrification Section, and W. M. Timmerman, of the Household Appliance Division of the General Electric Co.; D. C. McCoy and W. H. Teeter of Frigidaire Division, General Motors Corp.; E. M. Farmer, president of Gould-Farmer Co.; Frank H. Ryder, president of the Harder Refrigerator Corp.; J. A. Archbald, Jr., president of the Jewett Refrigerator Co.; A. J. Van Schoick of the New York Power and Light Corp.; Larry Gubb, president, and W. Paul Jones, vice-president of the Philco Corp.; Will B. Presba, vice-president and H. E. Wheeler of Presba, Fellers and Presba, Inc.; R. D. Pike, engineer, industrial department of the Rochester Gas and Electric Corp.; W. E. Hursey of Sears, Roebuck and Co.; R. W. Ayres, of Sunbeam Electric Co.; and Richard Markley, Jr., of Wilson Cabinet Co.

The Food Council of Cornell is the first of its kind to be assembled in the U. S. Its purpose is to determine the most advanced and scientific methods for food preservation, both for the duration and post-war period. All research facilities of the University are being employed in the project. Scientists and research experts of the Schools of Nutrition,

Home Economics, Chemical Engineering, Mechanical Engineering, Agriculture, and all other departments of the University have a part in the undertaking.

At the recent conference, H. E. Babcock, chairman of the board of trustees of Cornell, sponsor of the Food Council, called the meeting to order. Mr. Babcock discussed the various phases of the organization and its purpose.

Dr. Edmund E. Day, president of Cornell university, then took control of the meeting as permanent chairman for the morning session.

Dr. Day introduced as first speaker Mrs. Nancy Masterman, Research Investigator of the School of Home Economics. The following is an outline of her talk, which concerns suggested changes and improvements on the presently installed home freezers, based upon her survey of users of home freezing units.

Is It Convenient to Use

"Home freezing cabinets as they have been constructed have performed to the general satisfaction of their users. That is, they have provided a temperature low enough for freezing a satisfactory product and a storage temperature low and constant enough for holding that product over a long period of time.

"The cabinets are all fairly new

and have not presented many problems of breakdown or repair.

"The outstanding problem to be solved in the design of a home unit is that of convenience in use.

"Users of home cabinets would like to see the following features given consideration:

Some Improvements Asked

"I. Since temperature control is the main factor in successful freezing and storage of food the design should provide:

"1. A thermometer readily visible from the outside so that readings can be taken at any time without opening the box. This might be a high-low or a simple thermometer.

"2. If there is to be a manual thermostat control, it should be located in an accessible spot, and easily manipulated with a knob or dial.

"3. Many users desire an alarm device to indicate power failure or failure of box mechanism. This might be a light or a bell alarm to indicate when the power is off or indicate a rise of 10° in the temperature of the box. The device might be an extra to be purchased as desired. Alarms have been installed at considerable expense which might be less if taken care of at the time of manufacture or provided for by the manufacturer.

"4. If a fan is provided to speed freezing it should be located to create good circulation of air around the packages without taking up room in the freezing compartment.

"5. The motor fan should be more accessible to make repairs less difficult.

"6. There should be more soldered connections to prevent loss of refrigerant.

"7. Insulation should be sufficient to provide for successful and economical operation. Sweating should be eliminated if possible—especially sweating around the lids which blisters the finish; rusts the box; runs down into the compartment to form frost; gets the user wet when removing food. Sweating in some cases is so profuse that it drips on the floor from the sides of the box.

A Prettier Finish?

"II. Users are not interested in a deluxe finish but do want a finish that is durable, easily cleaned and attractive; a finish to stand bumps and knocks; a finish to stand sweating if sweating there must be.

"The color desired depends upon the location of the box in the home. White is not desirable for basement locations. Some users object to a coffin-grey.

"III. A defrosting problem exists varying with the location of the box, the use made of it, and the skill in packaging. Some method of defrosting should be suggested or provided for by the manufacturer.

"A defrosting tool might well come with the box. A tool similar to a hive tool with corners rounded off a putty knife with sharp corners removed would simplify defrosting and be less of a hazard to the box lining.

'Gadget' Suggestions

"IV. Many users would like to see removable shelves or some arrangement in the freezing compartment to facilitate packing for freezing and to make it possible for flat packages to stay flat when frozen.

"V. Covers hinged rather than loose, well insulated, with handles or knobs large enough to grasp are desirable. A clamp to hold the cover down would make for a tight closure.

"VI. A locking device incorporated when the box is built rather than by personal installation would please many people.

"Refinements or gadgets on a cabinet should not be such that they greatly increase the price or sacrifice storage space.

Can Food Be Readily Obtained?

"VII. The greatest challenge to the ingenuity of the designer of a home freezer cabinet is that of making it possible to locate the desired food readily without handling many packages and continually sorting the contents of the cabinet. A great deal of study has gone into the problem of what to put into a cabinet, very little into how to get it out.

"Cabinets of the present are:

"1. Too bulky to be conveniently located in homes, or to be moved into a home.

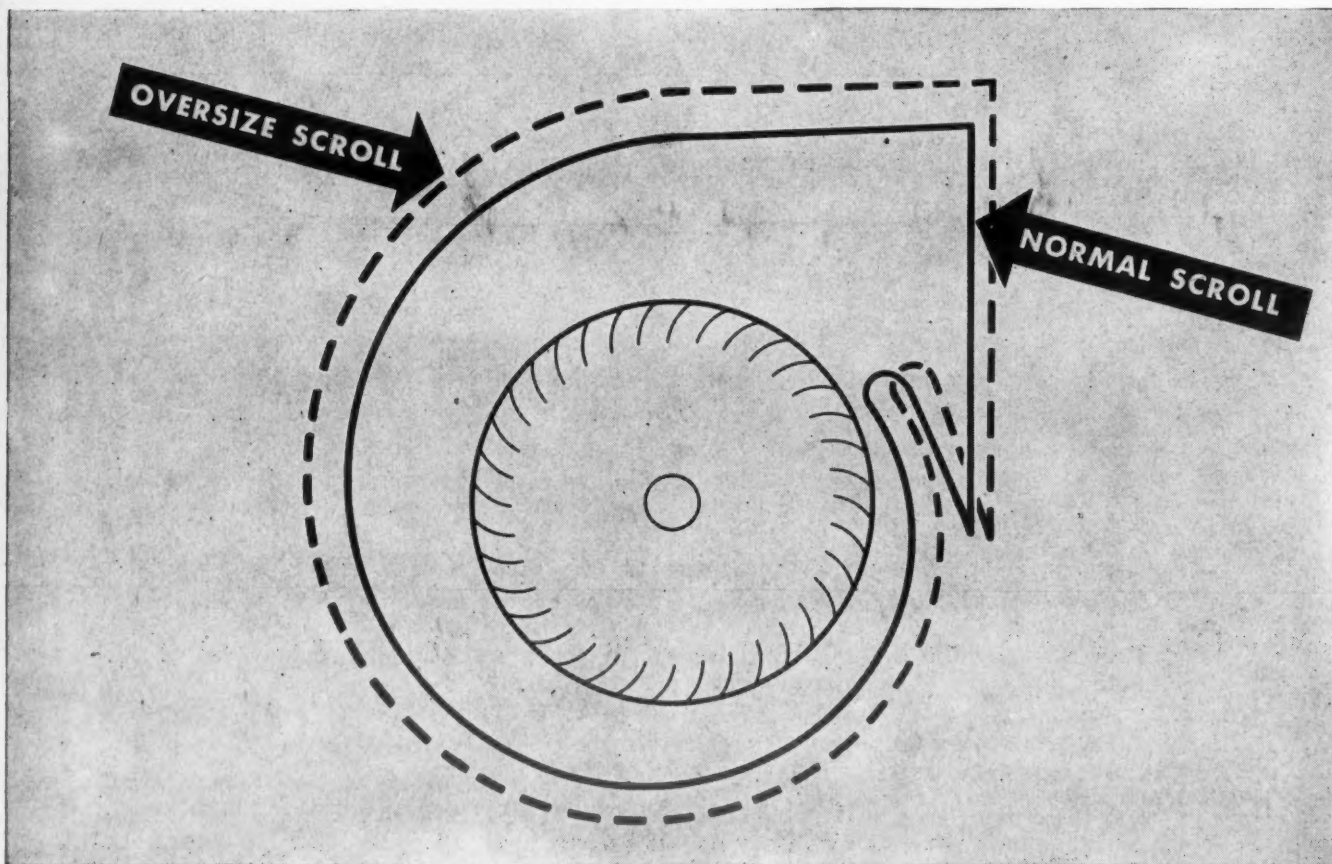
"2. Too deep for most homemakers to use with any degree of ease. Very few women can reach the bottom of the cabinet.

"3. Too difficult to organize to make the wanted package readily available without handling many packages. This is a time consuming, aggravating, uncomfortable process.

(Concluded on Page 9, Column 1)

Tips for Designing Air Impelling Units

No. 3 of a series



Housing Scrolls

AS the performance of a blower wheel varies with the dimensions of the scroll of its housing, the scroll selected for a given wheel must be of the proper size in order to insure the satisfactory performance of the unit in which the blower is used.

To aid in this selection, the Torrington Blower Wheel Catalog (sent on request) gives the dimensions of the scrolls used in determining the ratings of all blower wheels listed.

In many cases, the dimensions for two scrolls are given:

A normal scroll, which provides good performance when the housing space is restricted.

An oversize scroll, which develops more free air than the normal scroll and may be used when space permits.

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NORTHERN INDIANA BRASS CO.
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VALVES AND FITTINGS SINCE 1904

The Home Freezer Is Dissected From the User's Point of View

(Concluded from Page 8, Column 5)

The problem has been solved for the commercial distribution of frozen food. It should be solved for the home.

"I believe there will be a place in every home for some kind of zero storage equipment whether it be a city apartment, suburban cottage or farm. We should see that it is convenient to use."

Dr. F. H. Rhodes, Director of Chemical Engineering, talked on the mechanical requirements of home freezers, the insulation necessary for efficient operation, the proper sealing of doors and lids, the construction and the exterior finishes needed for durability of such cabinets. He reported briefly upon the results of his research activities concerning several makes of home freezers which are now in operation in the School of Chemical Engineering Laboratory. His talk held important material for the manufacturers' representatives present at the council. A short discussion followed Dr. Rhodes' talk.

A frozen food luncheon was then served in the Green Room of the School of Home Economics under the supervision of the Director and Dean of the School, Miss Sarah Blanding. All foods served had been frozen in the laboratory of the School of Home Economics during the past two years. The menu consisted of fruit juice, dehydrated soup, broiler, spinach, broccoli and corn, and strawberries.

Dean Hollister of the School of Mechanical Engineering directed the afternoon session. The theme of his talk was "From the Earth to Consumer," a discussion of the correlated efforts of the various departments of the University.

Much of Field 'Uncharted'

Dr. Willis Gortner, assistant to Dr. Maynard, then talked about the many aspects and possibilities of the Food Council, going into detail concerning the many, still untried, avenues of knowledge regarding frozen food preservation. An hour's round table discussion was held directly, during which the manufacturers' representatives gave their opinions and suggestions on this subject.

Dr. Faith Fenton, Professor of Food Research of the School of Home Economics, ended the series of faculty discussions with a talk on the proper ways to prepare fruits and vegetables for freezing, and her findings relating to the varied vitamin content of different foods. Dr. Fenton also discussed the cooking and serving of frozen foods. An outline of the text of Dr. Fenton's talk follows:

Vitamin Losses

"Some of the general findings in regard to losses of vitamins are:

"1. During Freezing Procedures:
"1. No loss of ascorbic acid (vitamin C), thiamine (vitamin B₁), or riboflavin (vitamin B₂) occurred during the actual freezing process.

"2. The greatest losses of these three water soluble vitamins occurred during the blanching and subsequent cooling of the vegetables. For example, of a 30% loss of ascorbic acid from peas, 10% occurred during blanching alone and much of the remainder during subsequent cooling and washing of the peas.

"3. The longer the blanching period and the longer the cooling period, the greater the losses.

"4. Blanching in boiling water caused greater losses during home freezing procedures than did blanching in steam. For example, broccoli which was steam-blanching lost only 8% of its ascorbic acid while that which was blanched in boiling water lost 4.9%.

"5. After blanching, the relative distribution of the vitamins may be changed. For example, before freezing the buds of broccoli contained about one-sixth more ascorbic acid per gram than did the stalks. However, after blanching the stalks contained twice as much per gram as did the buds.

"6. The frost of some frozen vegetables is high in ascorbic acid; in fact, in some cases it is as high as is tomato juice.

"7. During storage of frozen vegetables at 0° F. to -10° F. for 10 months no further losses of ascorbic acid were observed in home-frozen asparagus and broccoli. No further losses of thiamine were observed during storage of frozen peas, corn, and spinach.

Suggestions in Cooking

"II. Losses During Cooking of Frozen Vegetables:

"1. Some cooked frozen vegetables may be as high in ascorbic acid content as are cooked 'fresh from the garden' vegetables and higher than cooked so-called fresh market vegetables.

"2. Some of the factors affecting the retention of vitamins during cooking are:

"a. The more cooking water used, the less the retention of ascorbic acid, thiamine, and riboflavin in the vegetable, and the greater the solution into the cooking water.

"b. Decreasing the cooking time increased slightly the retention of vitamins.

"c. Cooking frozen vegetables in a pressure saucepan resulted in maximum retention of vitamins as did also cooking them in a small amount of water in a covered pan for a minimum time.

"d. Most of the ascorbic acid, and practically all of the thiamine and riboflavin lost from the vegetables was found in the cooking water of the vegetables studied thus far.

"3. Frozen vegetables are not as subject to deterioration in color and flavor during cooking as are fresh vegetables.

Poultry-Freezing Ideas

"4. In the studies on frozen poultry it was difficult to note by casual

examination or by palatability tests any differences between chickens frozen rapidly or those frozen more slowly. The use of moisture-vapor-proof papers is essential for the retention of quality during the storage of frozen poultry. Studies on frozen beef gave similar results."

The conference concluded with a discussion of the many problems of the design and operation of home freezing cabinets by the manufacturers' representatives and refrigeration engineers present.

It is hoped that another conference can be held soon, possibly next fall after the harvesting season.

New CMP Reg. 5 Ratings Explained by WPB

WASHINGTON, D. C.—No down rating of maintenance, repair and operating supply orders is required, if such orders were placed prior to May 16, 1943, where an industry was reclassified to a lower rating by the amendment of CMP Regulation No. 5 on May 14, WPB has announced. This provision is contained in Direction No. 3 to CMP Regulation No. 5.

The regulation assigns a blanket preference rating of AA-1 to MRO orders for activities listed on Schedule I; a rating of AA-2 to those listed on Schedule II; and an AA-5 rating to any business not listed.

A business previously listed on Schedule I and shifted by the May 14 amendment to Schedule II must use the AA-2 rating, and if eliminated from either schedule, must use the AA-5 rating, on orders placed after May 16.

'Preparation' Data For Home Freezing Given

MANSFIELD, Ohio—Time is a vital factor in quick-freezing, warns Mrs. Julia Kiene, Director of Westinghouse Home Economics Institute, in discussing "home food preservation methods."

Try to arrange it so that no more than one hour elapses between blanching and freezing. Otherwise vegetables lose both flavor and vitamins.

Blanch exactly as for canning—in steam, for not over five minutes. Cool down quickly immediately afterward. To do this, have a large pan filled with ice water; when the blanching is finished, plunge wire basket into the ice water for one minute; then pack vegetables into cartons immediately.

Prepare fruits for freezing as you would for the table, place in a bag and seal. Prepare poultry for freezing as for cooking—clean, dress, singe and cut up if desired. Wrap in wax paper.

Glass jars can be used for storing quick-frozen foods, but are wasteful of locker space, also wasteful of jars that might be needed for canning. Instead, lay in a supply of containers recommended by the locker plant.

Fruits are usually packed first in a transparent bag which must be sealed in this fashion: Turn down the top twice, then apply a hot iron or hot knife. Place in carton. No carton is needed for vegetables. Just pack in heavy paper bags made for quick-freezing vegetables. Fold the top twice, fasten with heavy prongs. No sealing is necessary.

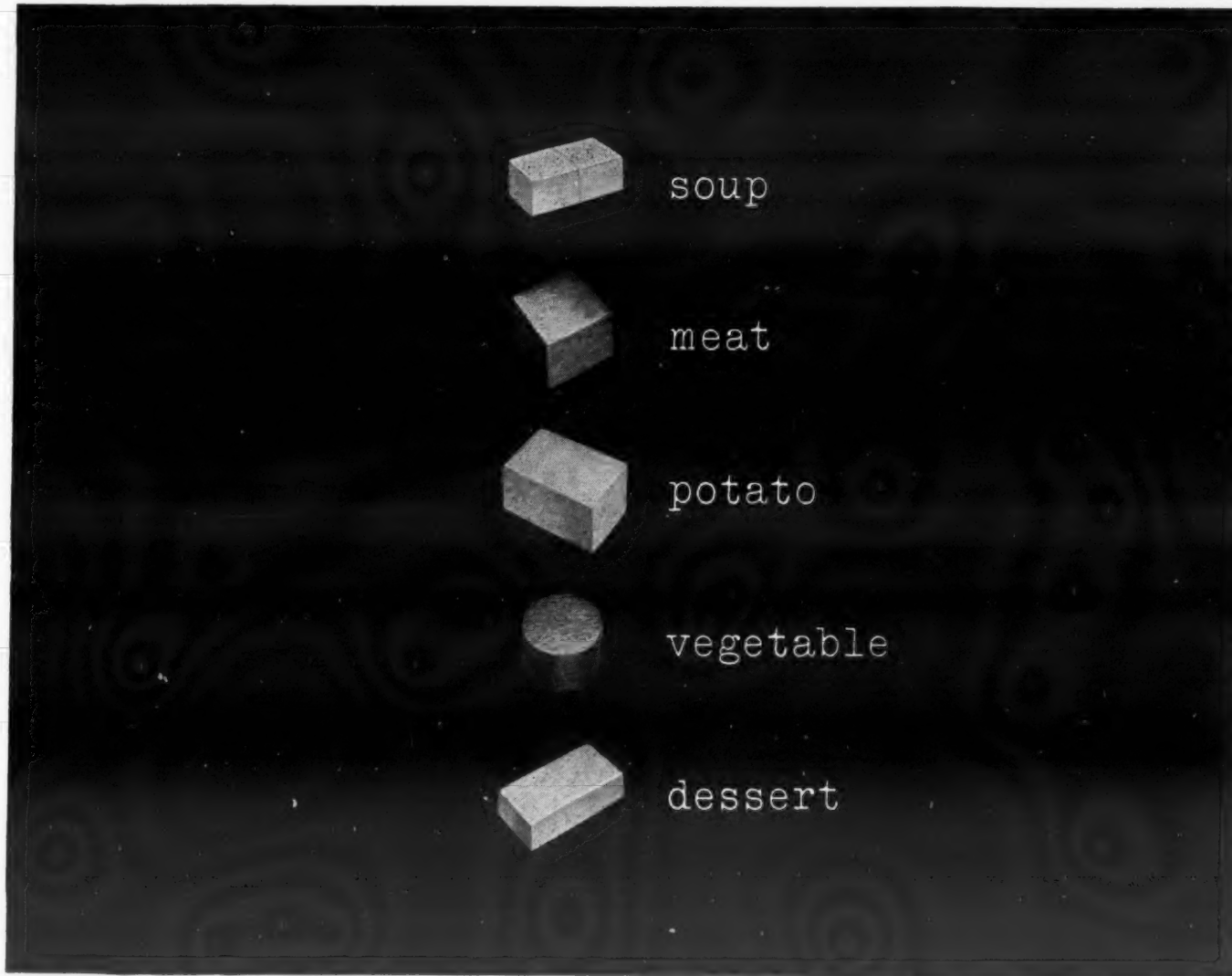
OPA Prescribes Who Can Use Order on Fixing New Prices

WASHINGTON, D. C.—Only those commodities which are still governed by the General Maximum Price Regulation and are not affected by any specific commodity regulation may have their prices figured by manufacturers according to the new methods provided by Amendment No. 54 to the General Regulation, declares the OPA.

A number of manufacturers whose products are controlled by specific regulations have misunderstood the precise scope of Amendment 54, issued May 29, 1943, and attempted to price their new items under it, OPA said. It emphasized that new types of consumers' durable goods, for example, must continue to be priced under Maximum Price Regulation 188. Under the heading "Instructions," Amendment 54 particularly states that it has no application to such merchandise.

OPA likewise pointed out today that new pricing methods allowed by the amendment may be used by manufacturers only in case their articles cannot be priced under Section 2 of the General Maximum Price Regulation.

The new pricing method does not apply to manufacturers for whom prices or pricing methods already have been established by OPA under Section 3 (b) of the General Regulation.



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Eight million American boys, all over the earth, fighting to preserve the peace and tradition of Dinner for Eight.

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Carrier engineers are helping to provide the control of air and moisture essential to proper dehydration by:

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2. Standardizing methods of preventing moisture regain in hygroscopic foods after dehydration and during packaging and storage of such products.

3. Engineering multi-stage tunnel dryers to properly utilize successively lower dry and wet bulk temperatures.

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Swart Describes Main Types Low of Temperature Test Cabinets and Outlines Problems of Design

**Discussion Embraces Low Sides, Flow Control Valves
Condensing Unit Characteristics, Control Methods**

CLEVELAND—Problems of engineering design for the refrigeration systems, controls and accessories, and cabinets themselves of the new low temperature test cabinets now being widely used in War industries, were outlined by R. H. Swart of the Kold-Hold Mfg. Co. during the recent spring meeting here of the American Society of Refrigerating Engineers.

Mr. Swart began with the assumption that any cabinet which is capable of obtaining temperatures of below -45° is a "low temperature cabinet," for the applications he would discuss.

Before the advent of high altitude aircraft, and before the demand for big production of all sorts of airplane accessories there was no market of importance for cabinets operating at temperatures of from -45° to -100°. This new demand led some pioneer minded manufacturers of cabinets and condensing units to start building these low temperature units on a fairly large scale. Use of such equipment spread rapidly into many fields opened up by the fact that the equipment was available. The output was practically 100% taken by war industries.

Mr. Swart said that a performance classification of these units would be

as follows:

Low temperatures only, -45° to -120°.

Low temperatures, and high temperatures, -90° to 210°.

Low temperatures, high temperatures, with humidity control.

Low temperatures, and vacuum.

Low temperatures, high temperatures and vacuum.

Low temperatures, high temperatures, vacuum and humidity control.

Temperatures, vacuum, and humidity must be easily adjustable.

Since most cabinets for these purposes are custom built around specifications for testing or processing a wide variety of items, another important factor to be included into the above classification is that of Time. In most cases "Time" is just as important as temperature, for either to reproduce either, time-temperature changes in flight of aircraft, or to obtain maximum production in certain processes.

A functional classification of factory assembled cabinets with self contained refrigeration machines, as ably presented by C. L. Olin, may be summarized as follows, said Mr. Swart.

'Low Only'—With Applications

Low Temperatures Only. (Subzero Cabinets)

This classification covers cabinets of sizes and shapes with top opening lids, side opening hinged doors, varying in sizes from 2 cubic feet to large self-contained walk-in rooms up to about 800 cubic feet. Such small cabinets are used for:

Cooling and storage of aluminum alloy rivets

Cooling metal bushings for shrink fits

Accelerated aging of machine gauges

Instrument assembly and parts tests

Quenching of high speed for maximum hardness and toughness.

Natural and synthetic rubber tests

Storage battery tests

Radio assemblies and parts tests.

Storage of volatile liquids

Removal of pitch from lenses.

Calibration of temperature measuring equipment

Blood plasma

The larger sizes are used for cooling and storage of aluminum spars or sheets, engine tests, hydraulic equipment tests, among many other applications. Both sizes often require glass viewing panes, pressure conduits, electrical terminals and other special features.

Low Temperatures and High Temperature, With and Without Humid-

ity. (High Low Cabinets)

These are used for aviation and other instruments which are not influenced by vacuum, and for radio equipment, and electrical parts. Some have the cooling equipment and heating equipment all in one compartment, or in two or three separate compartments, with one compartment used as the work space and the others for storage of refrigeration or heat for extra fast temperature change. Humidity control from 20% to 95% may be necessary for temperatures above 40°.

Such cabinets vary in size from 2 up to several hundred cubic feet. Forced air circulation is used.

The 'Vacuum' Chamber Type

Low Temperature, High Temperature and Vacuum, With or Without Humidity. (Altitude Chambers)

Cabinets of this type are made in a large range of sizes from one cubic foot bell jar in a subzero cabinet, up to several hundred feet. There are two basic designs, Mr. Swart explained, the smaller sizes are often made with the inner liner pressure resistant, and preferably with refrigerated plate sides. The larger sizes are often made with round or rectangular outer pressure resistant housings, and with a light weight, plain or refrigerated liner, and the insulated space is free to breathe into the inner space.

Like the "High Low" cabinet, these are constructed with one, two, or three separate compartments, depending upon the necessity for refrigeration or heat storage effect for fast temperature change. Forced air circulation is a necessity, and must be adequate at reduced pressures.

Among the uses are processing, inspecting or testing of: aviation instruments, radios, generators and other electrical parts, fuel pumps, oxygen equipment, personnel.

One important feature of altitude units as well as "High Lows" is that the interior must be well illuminated, and large inspection windows provided.

With reference to cabinet construction, Mr. Swart declared that all types must follow good refrigeration practice, but many design problems are much more critical in the low temperature units.

Four Types of Low Sides

Four basic types of low sides are used:

- Plate liners
- Finned coils
- Bare pipe coils
- Eutectic plates

For low temperature work, plate liners are particularly adaptable, according to Mr. Swart said. As reasons for this Mr. Swart said that a plate low side is basically an extended surface of low ratio between secondary and primary surface, with negligible temperature differences between any part of the exposed area. The very fluffy insulating type of frost which accumulates at temperatures below -70° is very undesirable on any type of surface, but on plates it does not interfere with air convection, and is easily removed.

There is no gain, Mr. Swart claims, in piling up large quantities of heat on large finned areas because the heat transfer from metal to evaporating refrigerant is adversely affected by many factors, (1) Low refrigerating vapor density with consequent insulating affect, and low film coefficients; (2) Low velocity pressure effect to carry along liquid refrigerant, and to prevent erratic ebullition; (3) Extremely high ratio between volume of vapor and volume of liquid per unit weight of refrigerant resulting in very little wetted metal surfaces; (4) Very low permissible pressure drop in direct expansion (or dry) system, and very low permissible static head in flooded systems because a small pressure loss constitutes a serious temperature loss.

Looking Over the Low Side

Finned coils are useful, said the speaker, where forced convection at high velocity is needed and where plate liners do not supply sufficient surface. One feature of finned coils in these applications is the fact that there is little or no tendency for excessive frost build-up because of the fine dry sandy nature of the ice, and it is not possible to use this type of surface to obtain humidities below saturation at low temperatures and appreciable air velocities.

Pipe coils are applied chiefly where their high heat capacity is an advantage for refrigeration storage.

Hold-over or eutectic plates are very useful in the above type of work, declared Mr. Swart. They may be filled with various solutions as required for low temperatures. They are particularly adaptable for storing reserve cooling effect for obtaining very fast cooling to reproduce temperature conditions obtained in airplane climbs.

In any type of low side the surfaces must be very large. A 20° spread between air and refrigerant which is common in commercial practice must be cut to 10° or even 5°, bearing in mind that compressor displacements double per each 20° suction temperature drop.

Liquid Feed All-Important

The matter of liquid feed is very important in low temperature work. Generally, the faults and limitations of conventional refrigeration feed devices at high evaporator temperatures are much intensified at temperatures below -60°F.

There are two distinct methods of feed in low temperature practice: (1) dry or direct expansion type; (2) Wet or flooded type.

In the dry type, said Mr. Swart, the feed device must have the following characteristics:

(a) Provide a continuous flow of refrigerant. Because of the minute quantities of liquid fed, cyclic operation of the valve is conducive to high temperature differences between refrigerant and fluid.

Eliminate frost back entirely. Any slop over constitutes a very serious loss of refrigeration effect in the system.

Feed correctly over a very wide temperature range, although it may under feed during pull-down.

As yet no single device performs these operations as well as desired, thinks Mr. Swart. Thermostatic expansion valves are commonly used, but they are operated by the differential pressure between power element bulb and suction pressure, and they have a definite friction loss, as well as orifice regulation loss, resulting in a rather wide super-heat differential, says Mr. Swart. He also stated that because of a time lag between initiation of an overfeeding period and the

(Concluded from Page 11, Column 1)

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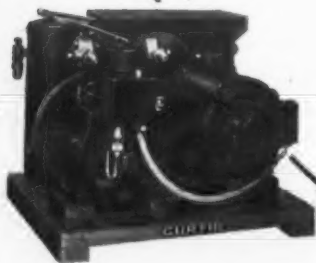
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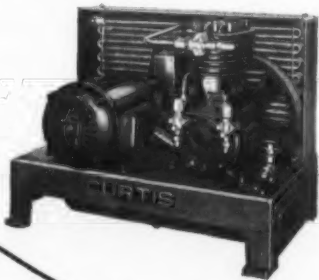
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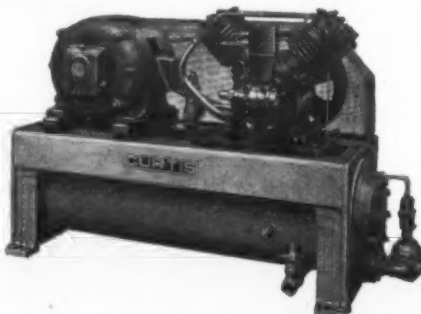
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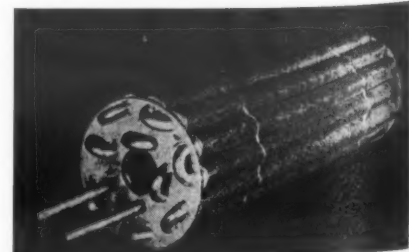
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Starting and Pull-Down Operations and Controls Are Important In Sub-Zero Work

(Concluded from Page 10, Column 5) registration of same on the power element, there is added tendency for "hunting". Various methods have been devised for decreasing the amplitude of the cycles of overfeed and underfeed caused by these factors.

The constant pressure type expansion valve, the author avers, has most of the above limitations plus the disadvantage of very slow cooling rates on a pull-down.

Capillary tubes show an improved feed condition, he said, but the compromise between high refrigeration losses with warm condensers or very slow cooling rates is far from satisfactory. Development work on high side floats indicate possibilities for small cabinets.

On large systems, one manufacturer recommends the use of a flooded system, using a patented method of feed regulation to obtain oil return. This method has an advantage of improved internal film coefficients, but requires very careful engineering of each job, Mr. Swart cautioned.

Types of Insulation

Because low temperature cabinets are used in various industrial processes, requiring a fast cooling rate, most of them are insulated with light weight insulation.

"Ferro-Therm", consisting of multi-layers of solder coated steel utilizing the radiant heat barrier principle is used in some cabinets. Fabrication of cabinets using this material require considerable assembly labor because of the wood spacers, which properly baffle and seal the air space.

"Santocel" is a very lightweight form of silica, which also is a very efficient insulating material. Structures using this material must be perfectly sealed inside and out, as this material flows like a liquid.

Fibre glass, while not as efficient as the other two per unit thickness, is also used because in many cabinet structures the insulation thickness requirements are governed by the necessity of deep breaker strips or thick bottom structural supports. In small cabinets the door and frame losses are equal in importance to the

insulation leakage.

As low temperature cabinets are often placed in modern plants where the users take pride in appearances, a certain amount of product styling along rugged substantial lines is desirable. However, the most important feature of a housing, Mr. Swart warned, is its careful sealing against external moisture.

Because of the varied usage of low temperature cabinets, the problem of finish is of importance. If the material situation permitted, stainless steel liners would be more commonly used, but in its place, galvanized steel or even painted steel is used. At low temperatures, the corrosion resistance of galvanized steel is acceptable.

Copper, aluminum, or even porcelain enamel liners may be used where the cabinets are used for high temperatures, and high humidities, and corrosion effects are very severe. Exterior finishes of synthetic enamels either air dry or baked are used.

Compressor Considerations

Turning to condensing units or low temperature work, Mr. Swart said there is a fast growing departure between the early adaptation of standard commercial machines to multi-stage work, and present low temperature units. A number of factors gleaned from field experience have caused this change.

In commercial practice it is quite practical to engineer a system to operate not more than 12 to 14 hours per day under peak conditions, and which will normally operate about 8 hours per day. In many low temperature industrial cabinets, such a design limit is wishful thinking, for if the condensing unit displacement can be supplied, a low side to balance it is difficult to apply. So it is not unusual for condensing units to operate 24 hours a day, 7 days a week. Compressor design problems have caused many changes in valves, clearances and seals, as well as lubrication.

Air cooled units are used on small portable cabinets, but water cooled units with water cooling on heads and cylinders are preferred, according to Mr. Swart. Cooling of commercial

compressors depend in part on the cooling effect of the returning suction vapor, and this effect is negligible in low temperature work. Seal failures may be more common than with usual commercial practice.

Types of Starting Hook-Ups

Starting and pull-down operation of low temperature units has been a problem of considerable importance. A 3-stage unit capable of obtaining appreciable capacity at -100°F. will load a motor about 60%. This motor at -40° is dangerously overloaded. It is not practical to install sufficient motor to start and pull-down, so one or more of the following aids are used.

- (a) Pressure operated suction line solenoid valve.
- (b) Pressure operated liquid line solenoid valve.
- (c) Liquid line restrictor
- (d) Hand or automatically operated unloaders
- (e) Step stage starting motors with two or three compressors.
- (f) Suction line pressure limiting valves.
- (g) Suction pressure operated unloading valves.

There are two general methods of obtaining low temperatures, Mr. Swart explained, the multi-stage compression system, and the cascade sys-

tem. Either type is basically a scheme to reduce the pressure ratio of discharge and suction to a value where clearance and leakage losses permit the actual displacement or pumping of vapor at reasonable volumetric efficiencies. Combinations of multistaging and cascading are also used.

Multistaging (or compounding) consists of connecting two or more compressors or cylinders in series each with correct displacement, so that the compression work is divided among them.

A cascade system comprises two complete refrigeration systems, the high temperature unit providing an evaporator, which condenses the discharge from the low temperature unit.

Multi-Stage Design

The multi-stage units have the advantage of simplicity and space economy, particularly where the staging is integral within the compressor. When two or more compressors are staging in a series hook-up the lubrication problem must be worked out, to properly distribute the oil between units.

This can be accomplished in several ways. One method utilizes the principle that oil pumping of compressors varies with the oil level. As the low stage unit pumps oil, it is discharged

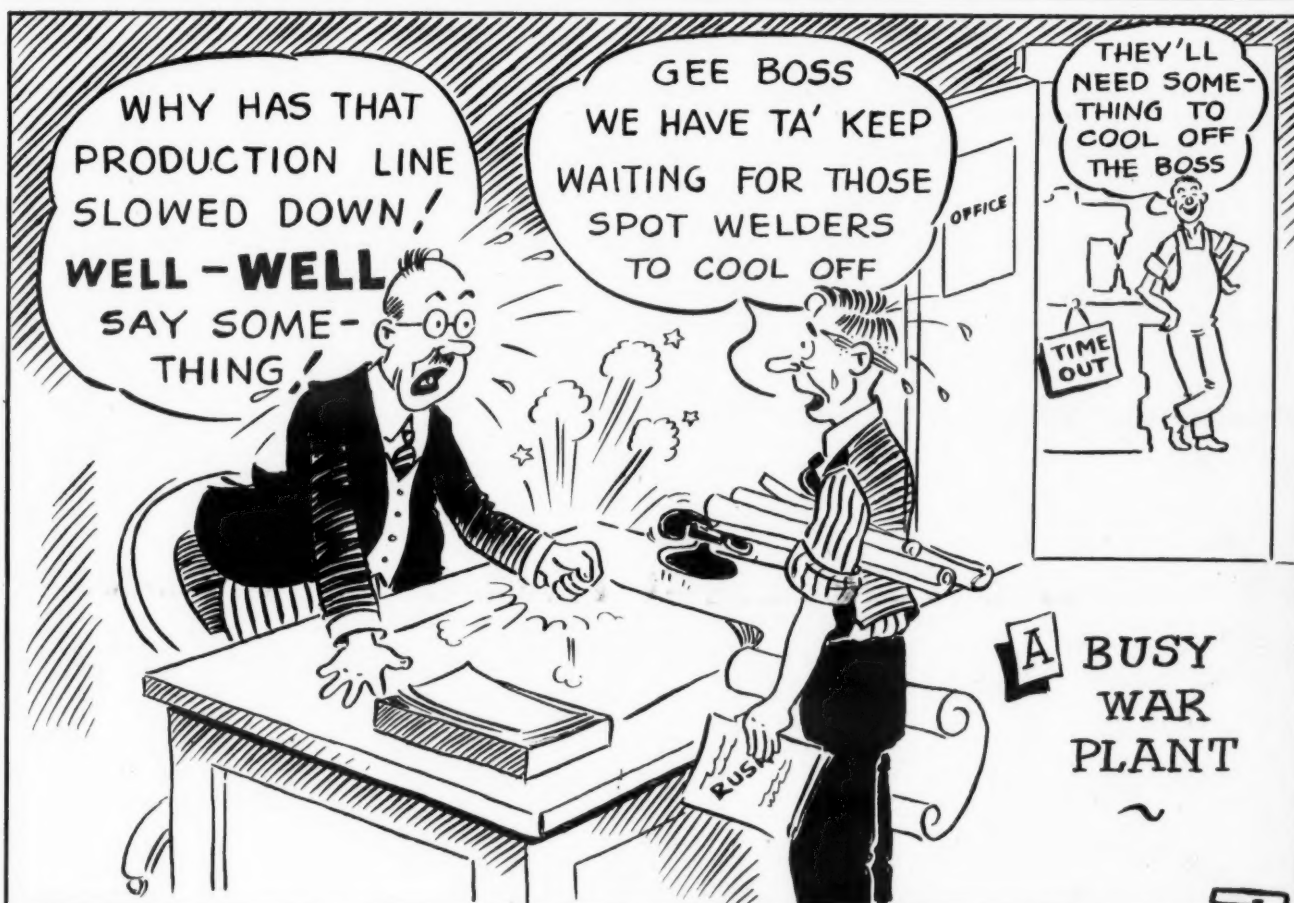
into the high stage unit, which is equipped with an oil separator discharging back into the low stage suction line, thereby reaching an equilibrium of oil pumping rates between units. Another method is to seal the crankcase of one unit entirely from the compression space, and operate both crankcases on the same pressure with oil level equalizing lines between the units. Still another method is to seal the crankcases and practically eliminate oil pumping.

One important advantage of the cascade system is in the possibility of using different refrigerants in the various stages. On large installations, it permits a very desirable flexibility in equipment selection. The high side assembly is more complicated in this method, though the refrigerant circuits are simplified, especially from the heat exchanger standpoint.

With all "Freon" refrigerants, it can be proven that from the theoretical standpoint heat exchangers are a vital necessity, but in small units, where lines sizes are small, it is difficult to realize these advantages, believes Mr. Swart, because the refrigeration savings are largely eaten up by the surface losses of the exchangers and interconnecting lines. This holds true particularly near the low temperature limit of the system where the final temperature limit is principally a

(Concluded on Page 12, Column 1)

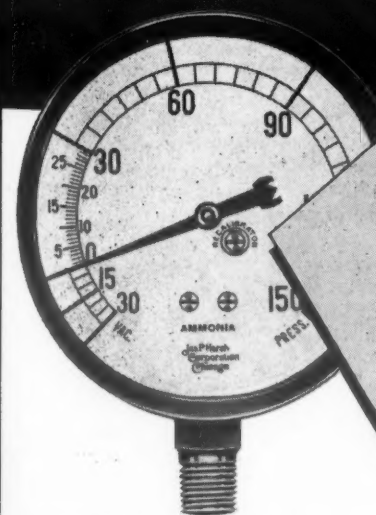
IT HAPPENS EVERY DAY



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MARSH

Refrigeration Instruments

Equipment Selection For Low Temperature Jobs Involves Some New Considerations

(Concluded from Page 11, Column 5) function of the volumetric efficiencies of the pumps, and the proper functioning of the refrigerant feed.

Because the majority of low temperature cabinets are custom built, and have such a variety of uses, the control systems are varied and relatively elaborate.

Temperature Control Methods

Temperature control is secured by one of several alternate methods:

- On-Off machine operation, by thermostat.
- On-Off electric heater operation with continuous machine operation.
- Suction line throttling valves, temperature operated.
- Suction — Discharge by-pass valves temperature operated.

A choice of types depends on the accuracy of temperature control required. Where possible method (a) is used, because of the availability of electric controls, with easily adjustable dials with temperature indicators.

The wiring involved in electrical control for low temperature cabinets is much more elaborate than for commercial cabinets. This is partly because condensing unit starting limitations require special arrangements, for example, it is necessary to restrict the suction pressure during the pull down.

One method utilizes a suction pres-

sure control in conjunction with either a liquid line or suction line solenoid valve which closes when the suction pressure is high. Mr. Swart pointed out that during the off cycle or when the machine is turned off, it is advisable to keep the system pumped down, because a crankcase full of saturated oil constitutes a hard starting load.

It has been found undesirable, he said, to utilize air conditioning practice of thermostat control for the liquid line solenoid valve with the suction pressure control starting and stopping the machine, because it is very difficult to set the pressure control at the very low cut-out pressures encountered.

Recommend Control Set-up

In a control system which Mr. Swart illustrated, the compressor stops when the thermostat is satisfied, and starts when the thermostat circuit closes, which is important for close temperature control. During the off cycle the machine will operate on the low pressure control to keep the suction pressure sufficiently low. When the heating cycle is turned on, or the manual on-off switch is open, the machine will keep the low side pumped out automatically.

For a vacuum control in altitude cabinets, various methods are used, depending upon the type of operation desired. A simple indicating or re-

cording electric on-off control may actuate the vacuum pump, with manually operated leak valves for use when raising the pressure. These have a sensitivity which may be too wide, in which case air pressure operated controls are available. For some work, program controls are necessary to give a definite rate of climb, or descent, governed by the shape of the controller cam. For many types of work, manually operated valves are sufficient.

An important point in connection with any vacuum control in low temperature work is to keep the amount of air admitted in bleeder valves to a minimum because of the bad effect of the warm air on any equipment in the chamber.

Humidity controls are often required on the warm end of the temperature cycle in "High-Low" and "Altitude" units. The control equipment consists of modifications of a wet and dry bulb instrument, either indicating or recording, which can be set by the operator. Moisture may be introduced in the form of a small spray, or as steam, depending upon the application. Dehumidification may be accomplished by means of the refrigeration machine.

For low temperature work the refrigerants commonly used are "Freon 12," "Freon 22," propane, ethane.

Ammonia and carbon dioxide may be used at temperatures above their solidification point.

Comparing Refrigerants

"Freon 12" has many advantages because of its safety, and availability, and also because of the relative ease of finding leaks. It is sufficiently

stable. Its principal disadvantages, said the speaker, are its high specific volume, and the very low solubility of water in the liquid, as well as the high sensible heat losses in the returning suction vapor.

"Freon 22" has many advantages at low temperatures, declared Mr. Swart. Its lower specific volume and higher latent heat effect about 40% more actual capacity per unit displacement than "Freon 12." Other advantages are better expansion valve operation, and higher water solubilities in the liquid. Leak tests are made in a similar manner to "Freon 12," and it is not flammable. Discharge pressures are well within the safety range of pressure members. A capacity approximation may be made by plotting the capacity of a "Freon 12" condensing unit against absolute pressures, and these capacities will hold roughly true for "Freon 22."

Propane as a refrigerant in low temperature units will produce slightly lower temperatures in a given system than "Freon 22," with slightly higher capacities. However, the hazard of explosion in case of leaks, as well as the possibilities of obtaining explosive mixtures within the cylinders of a compressor in case of a low side leak at low vacuum, limit application to locations where protection against these dangers may be secured. Leaks must be found with the aid of oil or soap bubbles.

Ethane is still a more powerful refrigerant, for the production of low temperatures. However, because of its high pressures at ordinary room temperatures, all parts of the system must be designed to withstand pressures of about 1,000 pounds, which prohibits the use of conventional low pressure receivers, compressors, evaporators, etc. Like propane, it is flammable and difficult to find leaks.

The commonly accepted practice of permitting the circulation of quantities of oil with the refrigerant in commercial and moderate low temperatures is not advisable at temperatures of below -40° because of the very slight solubility of oil in the refrigerants at the lower temperatures. Oils become paraffine-like at low temperatures and serious evaporator plugging occurs, as well as expansion valves sticking or plugging. Efficient oil separators are necessary, Mr. Swart stated.

Specifications Required

Because of the wide range of applications of industrial low temperature units, and the difficulty of interpreting any form of published ratings, it is advisable to engineer most proposals. The user will require specifications at one or more of the following:

- Pull down time with cabinet and load at ambient temperature
- Cooling time of load with cabinet at desired temperature
- Continuous cooling rate of product
- Evacuation time of Stratosphere cabinets, of cabinet and load
- Warm-up time from extreme low temperature to high temperature

The load may consist of a wide variety of materials or equipment, ranging from rivets to generators, including pieces of rubber, radios, storage batteries, and in many cases involve electrical input of considerable magnitude. The type of material or equipment being cooled has a great influence on cooling time.

If there is an appreciable change in the temperature of the fluid in the cabinet during cool-down this should be compensated for in the log mean temperature difference formula. During a pull-down, with both the cabinet and product warm, this temperature difference may only be roughly approximately. For a more accurate calculation, the method described by McAdams is recommended.

It is very apparent that the continuous cooling capacity, as well as the pull-down time of the cabinet is very necessary to make these calculations. The ultimate temperature effect of electric loads may readily be estimated but the cooling time of a piece

of equipment carrying an electric heating load may be only roughly estimated in cost cases.

It is often necessary to estimate the cooling time of a cabinet of new design before experimental data is available. This may be readily done by making up a curve sheet showing the calculated heat leakage of the cabinet, and the condensing unit capacity, with cabinet temperatures as the ordinate by correcting the machine rated capacity for the spread between suction temperatures and cabinet temperatures.

Considering the capacity curve and the leakage curve in temperature increments of 10° to 20°, and subtracting the leakage load from the machine capacity, the residual Btu, is available for removing heat from the interior of the cabinet. The heat capacity of the liner and contents can be calculated and the cooling time of each increment estimated. If the cooling time is slow, covering a period of several hours it is necessary to assign a part of the heat capacity of the insulation, framing members, glass panes, etc.

Other Problems Evolve In Discussion Period

Low temperature systems must be correctly engineered from the "start," declared C. L. Olin of Servel, Inc., in discussing the paper by Mr. Swart. It is difficult to make corrections in the system once it has gone into operation.

Questions are being raised about the use of oil separators with low temperature systems, he said, the matter of a "leak through" tendency at the needle being one of the problems found. Oil separators should not be used between the first and second stages of multi-stage systems, because of the resulting increase in pressure drop.

Mr. Olin sees a continuation of the demand for low temperature test equipment in the postwar period, when we will be "living in the stratosphere."

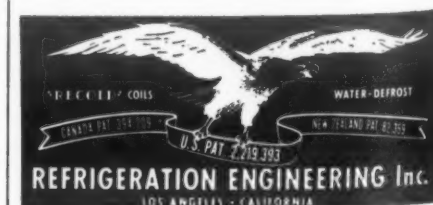
J. G. Bergdoll, chief engineer of York Ice Machinery Corp., in discussing Mr. Swart's paper touched on the arrangement of evaporators in low temperature systems. He declared that experience had demonstrated that the continuous coil type of evaporator was not suitable, because the volume of refrigerant gas handled resulted in big pressure losses.

York Co.'s recommended practice in such systems is the use of a recirculated or flooded evaporator type of hookup.

For stratosphere-type cabinets, said R. F. Tenney of Tenney Engineering Co., instruments and equipment should be developed so that flight conditions could be completely simulated. He pointed out that our fighting planes now go from very high temperatures to very low temperatures, and vice versa, within a matter of a few minutes, and that a complete change of temperature and humidity conditions are encountered in those few minutes.

Wyatt R. Brown Co. Is New N.R.S.J.A. Member

SAN FRANCISCO—The Wyatt R. Brown Co., 734 Harrison St., San Francisco, has become a term member of the National Refrigeration Supply Jobbers Association. Wyatt R. Brown is the proprietor of the company.



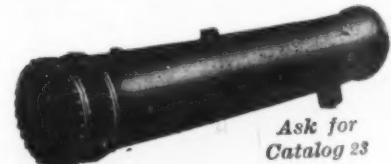
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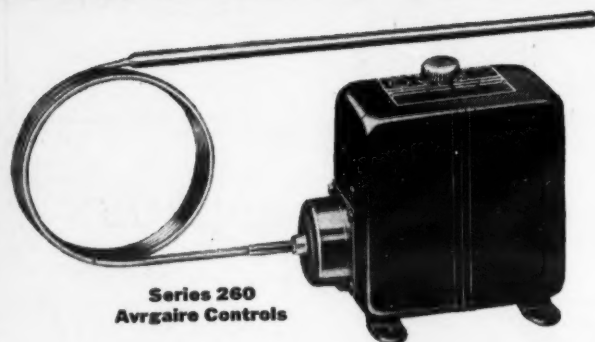
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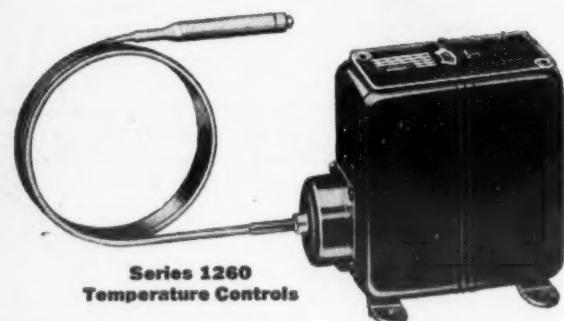
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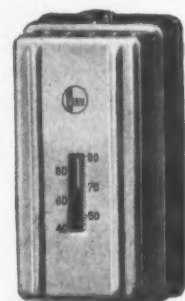
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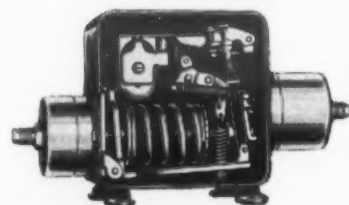
Series 1260
Temperature Controls



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Series 220
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Dual Pressure Controls

In the protection and preservation of our critical food supplies, and in helping to speed war production schedules which are already beginning to overwhelm the Axis, refrigeration and air conditioning controls are essential weapons.

The accuracy and dependability of Penn refrigeration controls can be of great help to you in your war-time service on the home front. Choose from Penn's complete line of pressure and temperature controls in both single and double pole, with or without calibrated adjustments, for single phase or poly-phase service.

In Penn's complete line there are refrigeration controls for all "above-freezing" applications—and, in addition, controls which may be set to maintain temperatures as low as -100°F; and pressure controls for as low as 28" vacuum.

Under established priority rules Penn can supply controls for every refrigeration need—for new equipment or to replace old controls which cannot be made to function efficiently. Penn Electric Switch Co., Goshen, Ind. In Canada: Powerlite Devices, Inc., Toronto, Ont.

Penn

AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

Failure to Provide Refrigeration Causes Carloads of Potatoes to Rot

(Concluded from Page 1, Column 5)
tatoes from California were arriving in good condition.

"California potatoes are iced before shipment and twice in transit. Shipments from the South come through without refrigeration. According to a Vahsling spokesman the percentage of rotten potatoes runs as high as 75 to 80% in some cars and from 10 to 20% in others. The Atlantic Commission Co., 102 Warren St., buying for the A & P chain, reported that it had been compelled to reject 'many carloads' of potatoes because of decay.

"H. P. Schwarzman, director of purchases for the non-profit Joint Purchasing Corp., which buys for many of New York City's voluntary hospitals and other charitable institutions, likewise reported that new potatoes arriving here were in badly rotted condition."

A Later Report

Following up with a later report in the June 16 issue, Mr. Bell wrote:

"Despite warnings of a developing food crisis throughout the nation, New York City received yesterday additional carloads of new potatoes from the South that had rotted in transit. The shipments had been made without refrigeration in accordance with a recent order of the Interstate Commerce Commission.

"The order, which had the approval of the Office of Defense Transportation, was modified last Saturday to permit of partial icing of refrigerator cars in which potatoes are shipped. The ICC ruled that 5,000 pounds of ice might be put aboard each car, which normally takes 10,000 pounds. Local produce dealers are skeptical that the half-way allotment will suffice.

'Unnecessary' Say Officials

"While it has been the contention of Washington authorities that potatoes from the near-by South, ordinarily in transit from three to five days, require no refrigeration, four carloads of potatoes arriving here yesterday from South Carolina were almost a total loss from spoilage.

"The daily market report of the fruit and vegetable division of the Food Distribution Administration of the Department of Agriculture, describing the market as "dull on decayed and small potatoes" and steady to firm on the best grades, listed 87 carloads as arriving, 90 as unloaded, and 50 on tracks. The report had no total of the carloads that had spoiled.

"But F. H. Vahsling, Inc., engaged in the growing, packing and distribution of potatoes throughout the United States, disclosed that it had received four carloads that represented virtually a total loss.

"These carloads of potatoes from South Carolina were consigned to the armed forces and were rejected because they were so badly rotted, it was explained by W. J. Augello, general traffic manager for F. H. Vahsling, Inc.

"Car No. FGE35351, shipped from South Carolina last Wednesday without ice in accordance with the ICC-ODT order, arrived in Washington on Saturday, consigned to the District Grocery Co., which turned it down because of spoilage.

"We immediately diverted the carload to New York City," explained Mr. Augello, "and yesterday morning when it arrived we refused it to the railroad. There were not enough potatoes in the carload worth salvaging."

Navy Refuses Shipment

"Car FGE22194, shipped out of Charleston, S. C. on June 8, was consigned to the Naval School on Westchester Ave., the Bronx. This consignee refused to accept the shipment and Vahsling inspectors reported that the potatoes were from 80 to 100% rotted, but the shipment was forwarded to Bridgeport.

"Mr. Augello declared that the huge spoilage of potatoes resulting from the ICC no-refrigeration rule for Southern new potatoes could be

attributed to official Washington's ignorance.

"These potatoes are young and full of water, thin-skinned and very perishable," he explained. "They are about the same as strawberries. On the contrary, the thicker skinned Fall and Winter potatoes can lie in a cellar for six months and then be shipped without refrigeration.

Disproves Officials' Claims

"Our records disprove Washington's contention that new potatoes can be shipped without refrigeration from the South to New York. While a shipment from South Carolina normally requires three days you can imagine how slowly freight is moving now with railroads congested with wartime freight."

"Mr. Augello supported the contention of Buell F. Maben, Regional Director of the FDA, that the proper Washington authorities had been appraised more than a week ago of the huge loss of potatoes resulting from lack of refrigeration. Mr. Maben estimated last Saturday that some 60 carloads, or about \$90,000 worth, had spoiled."

Patent Assigned To G-M on New Type Home Air Cooling

WASHINGTON, D. C.—A simplified, light-weight air conditioning system for small homes, built around the utilization of the attic fan principle of air circulation, has been designed by R. E. Gould of Oakwood, Ohio. Rights in the patent, No. 2,320,035, have been assigned to General Motors.

The problem in home air cooling apparatus of the weight of the compressor, cooling coil, and circulating fan often being too heavy for the attic of a small house, where the unit must be installed, has been overcome by Mr. Gould in his new design, by installing the compressor in the basement. This leaves only a simplified, light-weight cooling coil and blower for installation in the attic.

Water from the city mains is cooled by the refrigerating unit in the basement, and is then circulated to the cooling coil in the attic. Mr. Gould points out that at times the city water will be cool enough not to require operation of the unit.

Also, the invention dispenses with a complicated system of ducts. The cooled air is merely allowed to flow from the attic down stairways and halls, with slightly open windows assisting in its distribution.

'Items For Resale' In CMP-3 Not Meant For Repair Shops

WASHINGTON, D. C.—Manufacturers, permitted to use preference ratings assigned authorized production schedules to obtain products to round out a line, may not use their ratings indiscriminately to compel suppliers to furnish them with products for resale which they normally are able to produce themselves. This point was brought out by the Controlled Materials Plan Division of WPB in Interpretation 2 to CMP Regulation No. 3.

The applicable provision of the regulation is intended to permit a manufacturer to acquire resale items to round out a line which he normally sells as his own product in accordance with customary trade practices.

Examples of cases of rounding out a line are: (1) acquisition of repair parts or special accessories for the product being manufactured; (2) acquisition of articles necessary to complete a "kit" or "package" which is sold as such and thereby becomes the "product" of the manufacturer, such as goggles and gloves sold with welding equipment; and (3) acquisition of articles necessary to fill out a specific line or type of product such as sets of wrenches where the manufacturer produces some of the sizes in the set, but purchases the remaining sizes to complete the set.

This ruling, which is contained in Interpretation No. 2 of CMP Regulation No. 3, clearly indicates that the provision permitting a manufacturer to acquire items for resale up to 10% of his total sales, may not be used by persons operating service repair shops or similar enterprises which do not manufacture products for sale. In such instances, the person desiring to acquire materials to round out a line must do so as a distributor with respect to the entire quantity. This also holds true with respect to manufacturers who desire to obtain materials exceeding 10% of sales to round out a line.

In illustration of this general rule, assume that a manufacturer's authorized production schedule permits him to manufacture electric motors having a value of \$10,000. He may apply the preference rating assigned to the schedule to obtain all materials and components incorporated in motors produced by him under his schedule and, in addition, he may purchase up to \$1,000 worth of finished parts to be sold separately as repair parts for such motors. If the manufacturer desires to purchase \$2,000 worth of such repair parts, he may not acquire any of them with the rating assigned to his authorized production schedule.

LOOK FORWARD — GO FORWARD WITH NORGE!

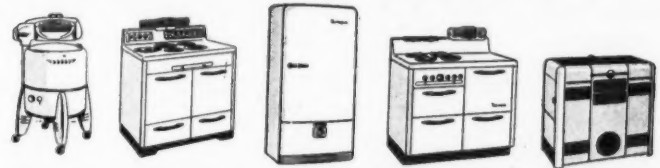
WHAT WE KNOW ABOUT THE FUTURE



We know the United Nations are going to win the war. We know there will be a tremendous pent-up post-war demand for home appliances. We know that Norge will be in a position to give its dealers and distributors products to sell as soon as, or sooner than, any other manufacturer. We know that the good-will consumer advertising we are doing now—and the merchandising and selling aids we shall offer—will keep Norge well up front in the home appliance field. There's a great future with Norge!

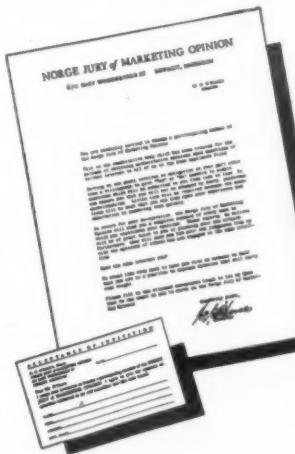
Howard E. Broad
President

NORGE SALESMEN ARE SELLING EVERY DAY



In every Norge home there is one or more Norge salesmen. Quietly, efficiently, effectively, they are demonstrating every hour of every day that the housewife can't beat Norge home appliances' utility, dependability and economy. At the same time, the service and counsel of Norge dealers are adding good-will to satisfaction. There's a great future with Norge.

THE N. J. OF M. O. IS FINDING OUT



Through the Norge Jury of Marketing Opinion there is being built up a mighty structure of opinions and suggestions of immense interest and benefit to Norge dealers. This wealth of marketing ideas will provide a basis for greatly increasing the post-war sales of Norge dealers, because they will help you know and serve your customers better. There is a great future with Norge.

KEEPING NORGE BEFORE MILLIONS OF HOMES

Always one of America's foremost advertisers, Norge is keeping the Norge name and Norge values before the housewives of America with full-page four-color advertisements in national publications having a wide circulation in millions of the best homes in America. And that's only the beginning! There's a great deal more to come. Your customers will know and remember Norge when the war is over! There is a great future with Norge.



NORGE

HOUSEHOLD APPLIANCES

Norge Division, Borg-Warner Corp., 670 E. Woodbridge St., Detroit, Mich.

When We Win—See Norge Before You Buy

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Problem: Who Is the Man?

AT a recent meeting of the Refrigeration War Council, which is fighting desperately to stave off an impending collapse of the nation's facilities for servicing civilian refrigeration equipment, the discussion finally boiled down to this question:

"WHO is the man in government we want to see? To whom can we present this urgent manpower problem, and obtain help?"

The answer came: "No such man exists."

Whereupon a brilliant executive who runs his own business, and runs it well, asked succinctly: "Then how does the government get its business done?"

To reply to that very pertinent question adequately would require several volumes of hundreds of pages each. And when it came to a summation, a conclusion, the authors of such an imaginary study would probably have to say: "Darned if we know, exactly."

DEFINITION OF GOVERNMENT IN THE UNITED STATES TODAY

About as near as one can come to it is to say that government today in the United States is a running series of compromises between committees composed of various politicians and administrators whose authority is not clearly defined.

Most businessmen today are slowly going nuts trying to cope with the baffling rat-race which such confused lines of authority have engendered. Yet, there isn't much can be done about it so long as we are trying to fight umpteen different wars all over the face of the globe.

It's all too big and too complicated for any one man to administer, or even for any small group of men to administer—small enough a group, that is, to be wieldy. To no point can one cite the cases of Britain, Canada, and Germany, where they seem to run a war economy so much more smoothly than we do. Those countries are much

They'll Do
It Every
Time
By
Jimmy
Hatlo



smaller, more cohesive, and not nearly so advanced as we are.

For years we have been arguing that the United States is much too big, too advanced, too complex, and too diverse to be run as a totalitarian state. And now that war has forced us into trying totalitarian controls after a fashion, the proof is certainly apparent.

Even the most deep-dyed of the totalitarian-type reformers who filtered into the New Deal are now throwing up their hands in hopeless horror at the problems which so Herculean a task has uncovered.

IT WILL NEVER UNTANGLE SO LONG AS WAR LASTS

Nevertheless, we are forced to go on with it for awhile. As long as the war continues, we shall probably never be able to "settle down" to an orderly routine of business. We shall never be able to "plan" adequately, because the progress of warfare today is so unpredictable.

As an admirer once put it at a meeting of the WPB Requirements Committee: "How can you estimate battle damage in battles which have not yet occurred?"

Business men are accustomed to dealing with responsible individuals. If they have a problem with a certain company, they take it to the man responsible: the purchasing agent, the sales manager, the production chief, the president, or the chairman of the board.

No such delegation of authority exists in our government today. Occasionally an administrator like Bill Jeffers comes along and seizes the bull by the horns. But if all the administrators charged ahead to their objectives so uncompromisingly, we'd probably be in one helluva mess.

JOB AHEAD IS LONG AND DEVIOUS, BUT CAN BE LICKED

So, in trying to solve the nation's serious refrigeration problems today, we shall have to deal with the War Manpower Commission, the War Labor Board, the War Food Administration, the War Production Board, the Office of Price Administration, the Office of Defense Transportation, and possibly some others we don't notice now but who may be able to gum up the works unexpectedly.

It will be a long, trying, discouraging job, with no assurance at all of eventual success. But it is a job that must be done.

LETTERS

NEWS! A SERVICEMAN IS LOOKING FOR A JOB

1866 Pennsylvania Ave.
Indianapolis, Ind.

Editor:

In all of your recent issues of the News you print articles about the scarcity of refrigeration men. I fail to see it. I have been trying to obtain a position in refrigeration or air conditioning and can't do it. It is true there are numerous jobs for \$25 to \$35 a week but what about us married men with families. I have four children and it takes more than that to keep my family together.

I have been a refrigeration and air conditioning man for 13 years. There is not, to my knowledge, an examination in the country I can't pass to obtain a license to install, service, or maintain any type of refrigeration or air conditioning machinery.

I have had my picture in the News with a write-up of my experiments with low temperature work in connection with sharp freezers for citrus fruits and juices.

Due to the fact that I am unable to get a job at the ice machine business I am now working as a journeyman steamfitter on construction work. The job I am working on now is installing the air conditioning at the Curtis Wright plant in Indianapolis and this is the first time in over a year I have ever seen an air conditioning plant.

If you could help me or tell me how to obtain a position or give this letter to anyone interested in hiring a good mechanic I would appreciate it very much.

I am only 27 years old but have had considerable experience handling men. I was in business for myself for three years before the war.

Yours with hope,
Floyd Riebe

ST. LOUIS SCHOOL OFFERS TRAINING IN SERVICE

The David Ranken, Jr.
School of Mechanical Trades
4431 Finney Ave., St. Louis, Mo.

Editor:

I have read with interest your article "Inside Dope" in the April 12 issue of the AIR CONDITIONING & REFRIGERATION NEWS. The thought occurred to me that possibly you were not aware of the fact that the Ranken Trade School of St. Louis has one of the most complete refrigeration servicemen's training departments to be found in any trade school in the United States. We have been offering training in refrigeration and air conditioning under a special endowment provided by Eli Hilles Larkin.

We were not approached by the Army to train refrigeration servicemen, but we have been training United States soldiers in automobile mechanics and other special work since October, 1940. We have approximately 400 men in training at all times.

As an endowed educational institution, we are not privileged, nor can we afford, to carry on an extensive advertising program concerning the courses offered by us. Instead of making money, the Ranken Trade School actually spends more than fifty dollars per month on each of the regular day school students. The school is open to white men 16 years of age or over who can meet the entrance requirements. We offer both day and evening instruction, but nothing by correspondence. We believe that

the practical work which we offer fits in nicely with correspondence training which is provided by a number of reliable agencies. We have also a special service referred to as "special courses" for men who have had experience either theoretical or practical.

M. R. Bass, Director.

QUOTED

WASTED PAPER

IN these days of conservation of manpower and materials, something should be done by business-paper and other periodical publishers to eliminate waste circulation. Here are two great avenues of waste.

First is the mailing of complimentary copies to advertising agencies who handle accounts of possible advertisers; and to many individuals in the companies that advertise now, or may, perhaps, some time in the future; and to a long list of other publishers in return for their own periodicals.

Second is the mailing of free copies to concerns not really in the same business field, in order to pad out the so-called circulation which is supposedly used as a yardstick of value by space buyers. This is often done with the idea of making rival papers look bad by comparison.

The second avenue of waste is by far the larger. Some time ago I happened to run into a particularly bad example of this indiscriminate mailing of free copies of trade journals to those who do not want them and never read them.

In order not to work undue hardship on anyone, I shall say that the trade paper in question dealt with fans, since there is no business magazine devoted entirely to this subject, to the best of my knowledge.

I dropped in to see an old friend of mine in, let us say, the laundry business. In the reception hall, there was a table with magazines displayed on it, including the "Fan World," as I shall call it.

As Bill, my friend, came out to greet me, I picked up the "Fan World" and complimented him on his great breadth of interest in the more technical parts of his business, for he did use a few "fans."

Bill just laughed. "Oh, I have neither the time nor the inclination," said he, "to read any trade magazines except those devoted entirely to my own business. These people" and he waved his hand over about a dozen trade papers, "insist upon sending me their papers free of charge, but I never even take off the wrappers. As a matter of fact, I throw 'em all in the waste basket, but my receptionist sometimes salvages a few of them just to fill up the magazine table."

This gave me an idea. So I telephoned a few other people who use a number of fans—florists, butchers, bakers, etc., and asked if they received "Fan World." Many of them did, but they all said they never read it and they all wished the publisher would quit sending it to them.

One of these days, perhaps, some of our space buyers will do the same thing I did, and later tell the publishers their findings. Many padded circulations will shrink, and everyone will be the gainer, at any rate in war time. I am sure that W. G. Chandler, Chief of the Printing and Publishing Division of the WPB, would approve most heartily. Mr. Chandler wants all publishers to use less paper, not because of a shortage but to conserve men and materials for promoting the war effort.

—Henry Farrington of Firestone Tire & Rubber Co. in *Printers' Ink*.

UNCOVERING THE CONVENTION

NOTES ON THE A.S.R.E. SPRING MEETING

BY PHIL B. REDEKER

Insulation for Sub-Zero Work a Red-Hot Subject

No really red-hot controversies flamed to life at any of the technical sessions, but out of the discussion of "Jack" Stone's talk on low temperature insulation one felt the undercurrents of strong differences of opinion that generally sweep to the fore when a new subject is being explored. In insulation, as in all of the other factors involved in the matter of ultra low temperature work, there are many new considerations involved that throw old concepts overboard.

Possibly the best commentary on the matter was that of Nelson Cooper of du Pont's Electrochemicals Department. Emerging from the session that had been filled with charts, formulae, and pro's and con's of various methods "Coop" shook his head and commented: "Now I'll have to start all over again on my calculations for that little freezer-storage box I was going to build in my basement."

In the same easily competent manner that he plays golf and tennis, participates in "quiz" programs, and officiates in A. S. R. E. affairs, "Jack" Stone did an excellent job of presenting the insulation subject. When he was introduced we learned something about him we hadn't known previously—that he was with the Royal Canadian Air Force in World War I.

du Pont Chemist Offers Peek Into Future

L. F. Livingston, manager of du Pont's agricultural extension division, the man who gave the bang-up talk at the "Welcome Luncheon," peered intently from the speaker's table at someone at the first table below, then smiled and said, "Hello there, Bill."

Dr. William R. "Bill" Hainsworth of Servel, past president of the society, acknowledged the greeting, and then grinned at his wife Hawley. For the greeting had confirmed the suspicion he had upon reading the program for the meeting that Mr. Livingston was none other than his roommate of college days. It was the first time they had re-united in some 20 years.

Mr. Livingston had his audience gasping as he unveiled the things that we may expect from the synthetic materials that a war-speeded-up chemical industry is preparing for us—water and fire repellent fabrics for all kinds of uses, screening that "mends" together if a hole is punched in it, tubing that bends light, a liquid that will "hold" finishes indefinitely.

And the ladies who were drooling over the one nylon stocking that Mr. Livingston exhibited (he was careful to bring just one) will be more titillated to learn, as he explained in a later conversation, that it was of 15 denier sheerness (whatever that means) as compared with the 30 denier rating of the best nylon hose which has been sold commercially thus far, this meaning that it is much sheerer. Another reason for getting the war over with in a hurry, boys!

Two Who Will Join Forces With Uncle Sam

George Iwashita, the Stewart-Warner engineer, is expecting to be called into active service with the Army this summer (he may even be in by now). He is a Captain in the Reserves. He wants to see as much action as his brother, one of the few American soldiers who has been wounded in action in both the Pacific and European theaters of war. George's brother, who like George is a native of Hawaii, was wounded the first time during the Japanese attack on Pearl Harbor and added an oak leaf cluster to his Purple Heart medal when he was again wounded in the landing at Casablanca in the African campaign. Going to work soon for Uncle Sam is a man whose youthful appearance belies the fact that he saw active

duty in World War I and is a veteran of the entire span of history of the "small commercial" refrigeration field. That man is F. J. Marshall of Cleveland, regional commercial supervisor for York, who will go to work for the Signal Force division of the Army Air Corps at Wright Field.

In joining forces for the Air Corps Mr. Marshall goes to work for a big boss who was just his immediate superior in World War I—General "Hap" Arnold, Chief of the Army Air Forces. Way back then Marshall was the then Maj. Arnold's "radioman."

Speaking of Cooperation, Hear Mark Mooney's Story

Prize for the best stories told by the convention speakers goes to Mark Mooney of Carrier. Speaking about "cooperation" he told of the parson who, in complimenting a farmer parishioner on how he had wrested a living from a tough piece of land, said:

"What a wonderful job you and the Lord have done with this property."

"Yeah," replied the farmer, "and you should have seen it when the Lord was working it alone."

And it was also Mark's story of the Army officer who believed that a child's bent towards a profession should be followed, allowed a psychologist and his nurse assistant to conduct a test whereby the child was to be confronted with a toy warship floating in a tub, and a toy rifle leaning against the tub. Whichever he took to would indicate his leanings towards the Army or the Navy.

"Which did he go for," asked the anxious father as the test seemed to have been concluded.

"Neither," the psychologist replied. "I think your son is going to be a Marine."

"Why," queried the astounded parent.

"Well," the doc replied, "when we let him loose he grabbed the nurse."

Dan Wile Back In The Industry Swing

Dan Wile was getting congratulations and best wishes on his new connection with Carrier Corp. His oldtime friends are particularly pleased since it probably means that Danny will be seen more at meetings of the Society and other industry affairs.

Marine Refrigeration Is Still Booming

Marine refrigeration is still booming, relates Cecil Boling, the eastern manufacturers' agent who has done some specializing in this branch of the business. Main types of applications today are in the "floating warehouses" which are being constructed, refrigeration on Liberty Ships, and the general refrigeration and air conditioning equipment for the Navy's fighting ships, including such specialties as control room air conditioning, etc.

The technical sessions on low temperature work were getting the close attention of Tom Binder, whose "Amcoil" cabinets are doing a lot of low temperature test work for war industry.

Did Wendell Willkie Think He Saw a Specter?

Wendell Willkie, who was in and out of the Statler hotel all during the convention, was about to enter an elevator in which Jim Corey of Cordley & Hayes was riding when he suddenly did an about face and went the other way. Couldn't be that it was because Jim looks so much like Tom Dewey, could it?

Al Chadburn, the genial A. S. R. E. traveling ambassador, was giving "Dick" Dawson of Alco Valve Co. the recipe for keeping a traveling man's children from forgetting him. "Borrow a buck from 'em before you leave and they'll remember you all right," is Al's advice.

Incidentally, if you want a real good true story just bring up the matter of the Walt Disney short with Al. It hasn't anything to do with the movies.

The Committee in Research on the Permutational Nature of 52 Diversely Designated Pasteboards met in regular session in Room 750 and while as usual the results were in-

conclusive all those present agreed that the investigations were most interestingly conducted and expressed regrets over the absence of a number of committee members.



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- ★ PACKED AND PRESSURE CUP VALVES
- ★ CHECK VALVES AND LIQUID INDICATORS
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- ★ FITTINGS AND ACCESSORIES

Even though we are working "round the clock" on implementations of war, every passing month strengthens our conviction that refrigeration equipment is so vitally essential that we should continue to allocate an increasing percentage of our manufacturing facilities, personnel and planning to our refrigeration products.

THAT'S OUR POLICY . . . continuing to do even a better job of supplying, as promptly as conditions will permit, more valves, manifolds, heat exchangers, dehydrators, liquid indicators, fittings and accessories to manufacturers, jobbers, installers and service engineers.

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This advertisement is one of a series appearing in leading national publications including Time, Business Week, U. S. News and Industrial and trade publications. This program of more than 10½ million sales messages is a potent force to help Contractors sell Westinghouse Air Conditioning and Industrial Refrigeration for vital war needs.

**ONE CORNER OF THE
SECOND FRONT**

In this co-ordinated action by U. S. forces, tanks advance, followed by infantry, covered by artillery and an air umbrella. Fletcher Pratt, noted military authority, helped us prepare the picture.

Large quantities of our weapons and equipment on every battle front are made by Westinghouse. On the production front Westinghouse Air Conditioning and Industrial Refrigeration provide correct conditions of temperature, humidity and air cleanliness to make possible uniform quality, high precision, fewer rejections, faster output.

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ACK-ACK MADE ACCURATE. For perfect fit, intricate matching parts of antiaircraft gunfire directors are gaged and assembled at constant temperature and humidity maintained by air conditioning.



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Subscribers Pen Their Reactions to 'Liberty, Employment, and No More Wars'

Letters from:

W. M. Orr

William M. Orr Co.
1228 Brighton Rd.
Pittsburgh Pa.

Editor:

After reading "T. K. Quinn Replies," as published in the issue of your publication dated June 7, it seems to me that he has something on the ball and I would like to secure a copy of his book in question, "Liberty, Employment and No More Wars."

Will you please put me in touch with the source of supply.

W. M. Orr

O. R. McDonald

Brunner Mfg. Co.
Utica, N. Y.

Editor:

I don't know when I have enjoyed or got such a lift from anything as I have from Ted Quinn's reply to your criticism of his book. I hope you can find ways and means of keeping Ted stirred up because this is a subject with which I am in sympathy.

It is very important and Ted is a mighty able debator, nothing but good can come from it.

O. R. McDonald,
Sales Promotion Manager

Jerry Tyler

Tyler Fixture Corp.
Niles, Mich.

Editor:

Is the argument between you and T. K. Quinn a private fight or can anybody get in? If it is open to the public, I certainly want to say right now that in his reply of June 1, he most certainly did not even scratch you, let alone "nail your hide to the barn door." His "haymaker" swings at you were so wide of the mark that he reminded me of King Levinsky. After wading through the first third, I remarked to an associate that I would bet that he worked for one of the giant corporations. You can spot that type of business man every time.

Ever since the NRA days, I have never had any hopes that those of us who would like to see free enterprise survive would secure much help from the largest corporations in the country. There are doubtless many lovers of freedom among their top men but they are outnumbered by the Harvard Business School group of Eastern-educated synthetic rubber stamp type of executives who have worked their way up by either marrying the boss's daughter or spending half their time keeping sold to their immediate superior, and waiting for the men who really built the business up to die off so they can step into the ornate air-conditioned office and occupy a comfortable chair. Have you forgotten the alleged story about Myron Taylor of U. S. Steel inviting

John L. Lewis into Big Business's parlor chiefly because Mrs. Taylor was so favorably impressed with Mr. Lewis?

To get back to the NRA, it was evident to me that in 1933 certain elements in Big Business were desperately afraid of the more virile and younger "little business" and saw in the NRA a scheme that would eliminate competition and insure the future of Big Business whether they served the public well and faithfully or not. They failed in the effort at that time because we still had a Supreme Court that had convictions about the fundamental principles of Americanism.

Mr. Quinn tries in his lengthy letter to you to make up in quantity what his thoughts lack in quality. The accent he places on "Causes" rather than "Effects" reminds me of the local high school history teacher who annually came down to address the Rotary Club and who invariably made a great impression on the emotional type of thinkers when he talked about "no more wars" if the "Have" nations would give up part of their possessions to the "Have Nots." In those days, poor Germany and Italy were the "Have Nots" and he sympathized with them greatly. He was always talking about removing the "Cause" and the Effect would take care of itself. He has never since quite explained why Germany who had much more than Poland or much more than Czechoslovakia or Austria chose to be the attacker. His story had always been that it would be the "Have Not" who would do the attacking to take it away from the "Haves."

I have an eight-year-old son who has more than is good for him and his mother and I spend considerable

time and thought in endeavoring to teach him generosity, unselfishness, and Christian love for his fellow boys and girls. Most of his selfish attitudes are the result of his being a child.

In fact, it is chiefly because he is a child that he does these impetuous and selfish things. Now will Mr. T. K. Quinn tell me just how we are going to eliminate this eight year old boy's being a child. Nature made him a child and will keep millions of children coming in the world forever and a day in spite of Mr. Quinn and the New Deal. These millions will constantly have childish emotions and there is no way that these childish problems can ever be eliminated by theory and law. Does Mr. Quinn suggest that to eliminate this cause, we eliminate the child?

Thus there are sometimes "causes" that are always with us and, like windstorms blowing over trees, we have no choice but to remove the effects. This is just what Westbrook Pegler suggests doing when he wants to eliminate the Union racketeers and gangsters. I would say that the greatest problem this country has today is the fact we are being governed by a group of adolescent thinkers who never mentally outgrew their childhood. If we can get rid of them, we can then go places again. Before I leave the subject of children, I would like to point out that every year there are millions of little savages born, which is the chief reason why Mr. Quinn nor no one else will ever figure out a formula that will eliminate war. Mr. Quinn might as well try to work out a formula to eliminate bad weather. Nature never intended that there should not be strife and struggle because, had she done so, she would have changed human nature to start with and made us all fine folks filled with essential goodness and charity.

Now, let's get to the real meat of Mr. Quinn's letter to you, which seems to be on the subject of employment. One would think from his letter that employment was the panacea for all relations. If employment were as important as Mr. Quinn would have us think, I cannot understand why Jesus Christ did not talk more about it. I am certain that if anybody would have liked to eliminate war, strife, and trouble, greed, etc., it was Jesus Christ. I am certain that if he could have achieved all these things by simply telling the people to work out a system where everybody would be employed that he would have done so. It all sounds so simple when Mr. Quinn talks about it.

I recall when we moved our factory to Niles from Muskegon in 1932 which was the horrible year that the New Dealers always point to when the world was about to come to an end, that the spray painter in our small shop became involved in an automobile accident and we needed another quickly.

Not finding one in Niles, I went one Sunday to Muskegon to endeavor to secure one. After considerable looking around, I found a young man, 28 years old, with a wife and two children, who was supposedly a good painter. I told him we would pay his expenses to come to Niles and be the head man in our Paint Department which at that time had two employees. He shook his head, grinned at me, and said, "I like it here in Muskegon. I am living on the City and don't see any reason in the world why I should move away."

In the dark and gloomy year of 1932, I traveled the whole United States. I found people very much as I have found them since, happy and sad, ambitious and lazy, healthy and sick, wealthy and poor, employed and unemployed. They were that way in 1908, 1914, 1920, 1930, 1940.

There are only three conditions under which full employment can be assured. One is a War Economy such as we have today. The second is slavery, and the third is some form of communistic dictatorship such as they have in Russia. Speaking of communism, I really laughed when T. K. Quinn made this statement and I quote, "If I thought that the Capitalistic System in which I believe could not solve this problem of free employment satisfactorily and that the Socialistic or Communistic could solve it and preserve freedom, then I would be a Socialist or a Communist." I think that is one of the funniest sentences I have ever seen in the writings of a supposedly intelligent man. How could a Socialistic or Communistic System preserve freedom? It reminds me of the classic remark made by Mrs. Eleanor Roosevelt when she said that a free people need not object to giving up their freedom because they could always get it

back. Mr. Quinn's statement would be so simple if it weren't for those three little words "AND PRESERVE FREEDOM."

It reminds me of the permission granted the girl to go bathing. "Certainly you can go for a swim, my lovely darling daughter; hang your clothes on a hickory limb but don't go near the water."

Further on in his letter, he says he would, in effect, amend our Declaration to read, "Life, liberty, the pursuit of happiness and employment." Boy, is that funny! He seems to go on the proposition that all people want to work. I advise him to get out and travel around the country and get acquainted with his fellow Americans. There is a high percentage of them that do not want to work 12 months a year but are willing to work six or eight months a year. Of course, since the New Deal came along, many of them don't have to work at all so that is even better yet. Back in the good old days before modern super educated thinkers began to "save" mankind, they used to make ice on the mill pond in the little town where I lived as a boy. After a sharp freeze, the local ice company would put an ad in the paper, "Wanted 50 men to cut ice Monday morning."

On Monday morning, there would be two or three hundred men down there looking for a job to work a few days and have some extra money to spend in the cigar store.

These men and hundreds of thousands like them were unemployed from the latter part of November until the first of March every year and they didn't feel too bad about it. It's true their wives put up a lot of canned fruit, and they had a porker and a quarter of beef hung in the woodshed, and a bin full of potatoes in the basement. They lived a very comfortable and nice life, paid their taxes, sent their kids to school, and were good citizens. They had never heard of unemployment and would have been highly puzzled had some over-educated economist come along and offered them sympathy. Of course, it is true they weren't hanging around beer joints every night or the movies, or burning up gasoline and tires on the highways; but a man can have a pretty good standard of living today and not do any of those things either if he is so minded.

The best way to solve unemployment would be to develop individual "resourcefulness" so that people can if necessary become self-employed. Like Cal. Coolidge's preacher was against sin, so I am against unemployment but the workable cure is not government regulation any more than the cure against sin would be a whole series of Prohibition Laws.

The point I am trying to make is that there has always been unemployment, that there always will be unemployment, one of the chief reasons being that a lot of people do not wish to work 12 months a year.

At this juncture I would like to point out that unemployment has been one of the greatest booms to the high standard of living which we have in this country. I will grant that the statement I am about to make would never get a man any votes. To make it, one would commit political suicide. Nevertheless, it is true. A certain amount of unemployment is healthy because it spurs individuals on to greater resourceful thinking. There are several men who work for me who have told me that much of their success is due to the tough going they had as young fellows when they didn't have a job and they decided right then and there to fit themselves for something that there would be no question but what they would always have a job. In such preparation, they learned to think; and in learning to think, they got interested in their work and these men have made inventions and developed production and added to the wealth, prosperity, and healthy condition of this country. The old American system of each keg having to sit on its own bottom did something to people that no other system will ever do and the dynamic power of industrial America right today is a result of individual ambition which was usually stimulated far beyond an ordinary degree by hardship, lack of employment, and determination to rise from the uncertain position that the individual found himself in under the old system of Laissez-faire.

Why do people like Mr. Quinn not realize that you can't have your cake and eat it?

If you are going to be free, you have got to be completely free, economically free, and independent. Certainly the Negro slaves had social

(Concluded on Page 17, Column 1)



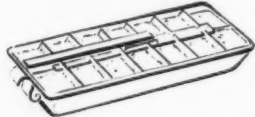
Someday—after freedom's final shot has been fired—the complete story of Inland's design, engineering and manufacturing contributions to products and processes of war production can be told.

Then, in the light of things

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Meanwhile, fully cognizant of the fact that they are better equipping themselves now to serve you later, several thou-

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Quinn's Book

(Concluded from Page 16, Column 5)

security. They were certain of employment, they were certain to be fed, and to have a place to sleep. If Mr. Quinn likes that sort of social security, more power to him, but he is going to find quite a fight on his hands from some of us who would find it intolerable.

I, for one, would rather starve to death and I mean literally so than have to goose-step in some procession of slaves under a dictator and I mean that whether the dictator is Hitler, Joe Stalin, Franklin Roosevelt, or T. K. Quinn. I do not know how many more people in America feel as I do on this point. I wish I did know because from the trend, I am afraid it will come to a show-down some day and I would kind of like to know who is on my side as contrasted to those who like their liberty while it is easy to have but the minute things get a little tough, they are willing to sell it for a few pieces of silver, a hot meal, a place to sleep, and a job working for a dictator.

I have just one more point to make, and then I will sign off. That point has to do with the direct relationship between political freedom and economic freedom. I sat at lunch one time in New York with some big business men, and I say big because most of them represented the huge type of corporation that Mr. Quinn does. Fortunately for the future of the United States, the majority of this particular group did not agree with Mr. Quinn's philosophy but were sold on individualism. A guest at the meeting was Dr. John Studebaker, Commissioner of Education, appointed by Franklin Roosevelt and I believe still serving in that capacity. Dr. Studebaker pointed out that time and again, he had argued with top officials in Washington that it was not possible to maintain political freedom for the individual unless the individual had economic freedom. This seems as true to me as Polonius' famous quotation in his advice to Laertes that "it shall follow as night the day."

If the government of the United States or any other government is going to have complete control over you financially, there is no question but what they will soon acquire and in perfect justice the right to control you politically. Now, if Mr. Quinn wants that and likes it, all right. He can work toward that objective if he wishes; but when he tries to hang that kind of a situation onto me, he is going to have a fight and, believe me, when that day comes, I hope you are on my side because I know that you are a real fighter for fundamental American principles and not some synthetic eye-wash developed by some funny looking down-Eastern professors.

Jerry Tyler, President.

Geo. Lindahl

The Super-Cold Corp.
1020 East 59th St.
Los Angeles, Calif.

Editor:

Ordinarily I do not comment on editorials in your paper but that one addressed to "Ted" Quinn is probably the most lucid covering of the position of small business that has come to my attention.

I believe you hit it on the head when you inferred that big business itself would atrophy if it was allowed to have a monopoly. It is characteristic of all humans that after they have accumulated a stake and have

"arrived" to merely maintain a "holding action" (using a military term) meaning, keeping what we got and only doing enough to prevent new competition.

I agree with you that if small business was eliminated that general progress would slow down. Whether this is good or bad for the human race is a moot point, as many consider that we are living too fast with too much idle time now, therefore progress, which makes work lighter and shorter should be stopped. However, the general public likes the idea, and as long as the public will buy new ideas, new ideas will be developed.

The principal urge to progress by established firms is the fear that if they do not continue to progress that smaller, less known firms who are progressive will "take their marbles away from them." If it wasn't for this fear most progress would slow down or stop altogether. The human critter is naturally mentally and physically lazy. He works because if he didn't he wouldn't eat. Some people work with their hands because it is easier for them to do that than to think. Physically lazy people work with their heads because that is easier for them. That is why nearly every labor saving invention was developed by a physically lazy person.

As far as I have been able to determine there are two main reasons that cause men to move at all. (1) Fear of punishment or (2) Hope of reward. Without these two motivating influences all progress would come to a dead stop.

The physically lazy man tries to figure out how to get along without physical exertion. He thinks about it. Soon he uncovers an idea. He tries his idea out. It works. Then he either forms a small company to make and sell the thing or presents it to some company who has adequate capital and organization to put it over. It is a safe bet that 90% of all ideas put over by large concerns was originally thought up and presented to them by some small fellow who was physically lazy.

If this small fellow isn't too physically lazy he will want to capitalize on his invention. He has a fear that if he presents it to big concerns that they will figure out some way to beat him out of it. So he opens a factory in the back of his garage and makes a few. His next step is to interest another physically lazy chap (the sales manager type) who incidentally is far from mentally lazy. This sales manager then interests others who do not like physical work (salesmen) and they are off to the races.

Another idea is born and marketed. Price at that time means nothing. Being new it is a specialty and a specialty must be sold by specialty salesmen. Manufacturing can be inefficient and costly but the firm still makes a profit because the specialty salesman can and does make his proposition so interesting to a certain segment of the public that they will pay whatever price is asked.

Practically every commodity had its start as a specialty. During its specialty period it was sold at high prices to compensate for inefficient non-volume production and high selling costs. Many firms who started in this way became low price volume producers. In our industry we can point to Kelvinator as an example. Others passed out of the picture but their work was taken up by well established firms who were engaged in other lines of business. General Electric and Westinghouse are good examples in the refrigeration industry.

How many firms who started in the

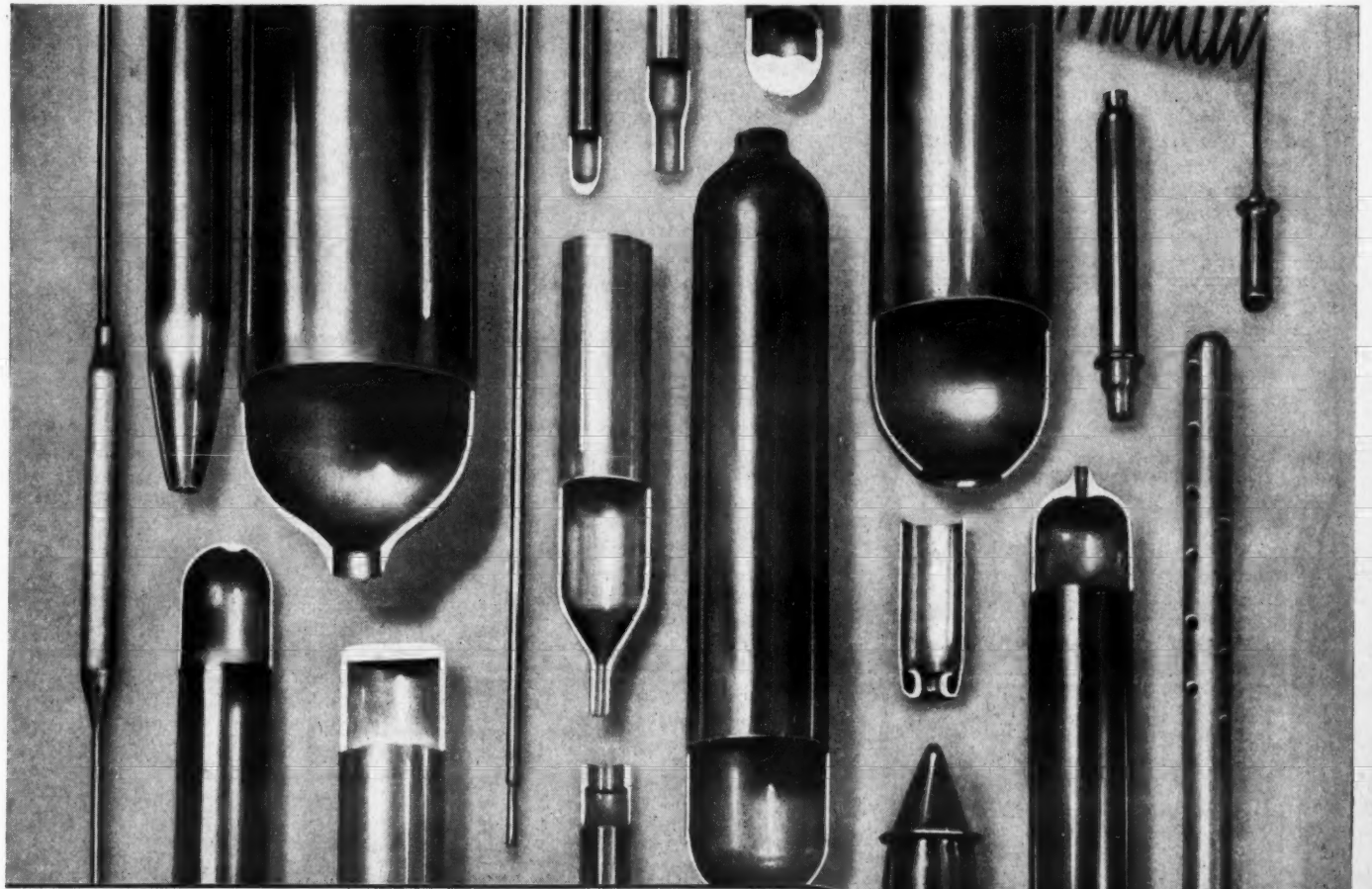
electric refrigerator industry in the period from 1918 to 1920 still remain in business? The same is true of the automobile business. How many who started now remain in business? My opinion is that big business should content itself with low cost volume commodity items, leaving small business the job of going through the development and specialty stages. Small business every day is laying the foundation for big business. It is pioneering new ideas and securing public acceptance. It goes through the financial hardships incidental to all pioneers. It takes the knocks from the general public and gets all the bad names for the reason that

it must continue to sell during development stages as that is the only way it can make profits to continue development. When it has gone far enough along this road and public acceptance is fairly established, then big business takes it over or copies it, goes into low cost volume manufacturing, mass advertising and the thing in question ceases to exist as a specialty and becomes a commodity. The writer dreams and thinks in terms of specialties. The cost of making a thing has always been secondary in my mind. If the idea has merit and has real value to the buyer, the price is not important. Ten per cent has always supported the spe-

cialty firms. The other 90% supports the big volume firm.

So far as I can see, there will always be a place in our general economy for any individual or firm who has imagination and initiative and who so thoroughly believes in his proposition that he can make others believe. And—if he makes enough of them believe he is able to build a competence of himself and jobs for others—and continue to lay the foundation for new commodities which are merchandised by big business.

Geo. R. Lindahl



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If you make anything from tubing—if your product has a completely closed end, is slightly reduced, or assumes any shape in between—

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Or even if your product is still in the design stage and has never been manufactured by any process . . .

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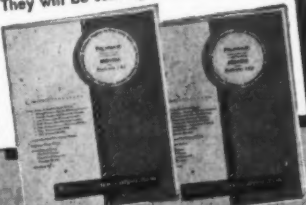
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Dealers Detail Ideas on Service That Make it Pay

DAY NIGHT WRITE FOR LATEST DATA

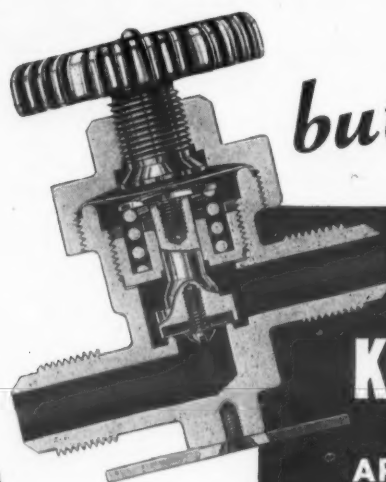
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DAY & NIGHT MFG. CO.
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PITTSBURGH, PENNSYLVANIA

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WAR PLANTS NAVAL BASES
SHIPYARDS HOSPITALS
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**AND NUMEROUS OTHER WAR-TIME ACTIVITIES
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A Complete line of Storage Type
Water Coolers in accordance with
Latest W. P. B. Regulations

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NAVY-2 Models ARMY-NAVY-2 Models
for Shipboard use for land use

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WRITE FOR LATEST DATA

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Figures Presented on Service Operations Of Typical Dealer

(Concluded from Page 18, Column 5) care of promptly. Other calls are taken with the understanding that the service will be arranged sometime during the succeeding five or six days.

"We are not encouraging increase of service calls, but rather retarding, to the best of our ability, incoming calls. Stimulating service today is leading with your chin. Drumming up service would result in inspections that would disclose a need for parts that would be impossible to obtain, and would overload our service men, with the resulting tendency to rush the work out. We deem it the better policy to maintain a cooperative attitude with the user, and when called upon, to render the service. We are avoiding to the best of our ability, a high handed attitude.

"We are listing definite facts regarding the operation of the department. Our fiscal year starts August first. During the six months' period from Aug. 1, 1942 to Feb. 1, 1943, our purchases at cost were \$1,944.98. Our inventory at cost Aug. 1, was \$3,612.94. Our inventory Feb. 1 was practically unchanged. Sales during that period were \$3,714.97 (a two-man service department), the gross profit was \$1,769.99. Salaries, overtime, and mileage, totaled \$2,050.04. Deduct from this item of expense, the item of \$701.58 (the labor item, at our cost per hour, for warranty service). The net expense in that case would be \$1,348.46. \$1,769.99 gross profit, less \$1,348.46 expense, is a net profit of \$421.53 for the six months' period. We are not particularly proud of this record, and do not feel that we could survive on service, but in any case it is our intention to remain in the picture, and we are obligated to render the warranty service. Under the circumstances, we feel that the operation of the service department is satisfactory, and is of inestimable value in maintaining customer contacts and strengthening our position in the local appliance market.

"To help you in understanding our operation we are including several forms. One form is in triplicate—the white copy is our office copy, marked charge, paid, or free. The yellow copy is for the customer, and the third copy (card) is the record for the service department with an analysis of the job. The other is a weekly form used by the individual service men. Each week he transfers the totals to the succeeding card and keeps the entire record without assistance. The two forms constitute the detail work involved in the operation of the service department."

The seriousness with which servicing dealers accept their responsibilities is reflected in the following notice posted in the repair department of the Ohio Furniture Co., Barberton, Ohio:

"No longer will it be supported by the Sales Department—it must support itself and help support this store.

"Profit must be made in this department, profit in cash and profit in 'Customer Goodwill.'

"Welcome any complaint you may receive on any make washer and sell the customer the service he needs.

"Remember—If you do this, this department will sell more parts at a profit, and this store will be the store where the customer will come to buy a new washer when new washers can be bought.

"Remember—Get that repair job. Remember—Keep a record of the job—make, model, serial number.

The Machine For Your Next Job...

If it's a refrigeration job...no matter how big or how small...we can supply Lipman equipment to fit the specifications. Let us work with you.

GENERAL REFRIGERATION DIVISION
Yates-American Machine Co.
Dept. AC-3, Beloit, Wis.

Model 153
Water-cooled
Machine



More Production of 'Necessary' Civilian Items Seen In 1944

NEW YORK CITY—An official of the War Production Board has predicted, according to the "New York Times" that during 1944 the consumer will be able to obtain more of the necessary articles, production of which is now practically at a standstill.

"The reason the consumer will fare better next year than now is that he will be able to get more of those essential articles which at present have practically dropped out of sight on the retail market," the official stated. "Also, although there will not be as many of some things he is accustomed to buying now on the market, there will not be enough less of them to cause him any difficulty."

It was asked that the "essential articles" mentioned above be not definitely named, to avoid misinterpretation on the part of consumers.

The two major questions in designing the civilian wartime economy are, "What is needed?" and "How much?" The WPB turns to its past experience and the 100,000 letters received daily for guidance on these problems. Expenditure is no measure of the need of articles.

SHORTAGES SHOW UP

Fixing a measure of necessity is becoming an easier problem for WPB as the war production goes along. At first, because of the large wholesale stockpiles and unusually heavy retail buying, it was harder to determine how much of what items were needed. Now, 300,000 items are classed as "essential" in the daily routine of an average American.

"Shortages are beginning to show up," the WPB official said, because the reserve stocks have decreased, and purchasing has become more normal.

Limited production of necessary items is being accelerated to relieve present scarcities. "Spot checks" of each consumer item are being made

in sample areas, to determine the necessity of articles. The WPB is trying to alleviate duplication of former mistakes which caused current shortages of civilian necessities.

The WPB denies any intention of applying a "bedrock economy." The official stated that the WPB made a study of this idea because "it was asked to do it."

'BARE SUBSISTENCE' OUT

The bare subsistence necessities for civilians, when under theoretical attack by military forces on both Atlantic and Pacific Coasts, were shown in this report.

Protection of the interests of manufacturers of products not necessary to the war effort and whose machinery cannot be turned over easily to war work, is one of the main duties of the WPB. "Widespread unemployment" would result if these plants and retail stores were to "shut down," speaker for WPB declared.

The WPB is attempting to keep the manufacturing of civilian goods at those factories which cannot be transferred to war production, rather than at plants which could do war work, if converted for it. It was said that it is better to keep factories putting out necessary items with non-critical materials than to "shut down" entirely.

Quartermaster Sends Frozen Food Shipment To Alaska, Cites Reasons and Savings

WASHINGTON, D. C.—A substantial quantity of quick-frozen vegetables will be sent by the Quartermaster Corps to troops in Alaska. Of the 71,000,000 pounds of quick-frozen vegetables to be purchased for all the Armed Services this year, upwards of 4,000,000 pounds will be sent to the Frozen North, the War Department reports.

The vegetables will include peas, snap beans, lima beans, cut corn and spinach.

Since the vegetables will be frozen by the instant-freezing process and maintained in a frozen state until they are thawed out for cooking, the

extreme Arctic temperatures will have no effect on them. Fresh vegetables and even canned vegetables might be ruined if subjected to natural freezing but the quick-freezing process in commercial use today does no damage to their palatability or constituency.

The quick frozen vegetables will be packed in ordinary commercial fiberboard containers and will require only a small amount of critical packing materials. If the 71,000,000 pounds of vegetables were to be packed in cans, they would require about 18,000,000 pounds of steel and 220,000 pounds of tin, the War Department announcement stated.

Old Household Refrigerator Rigged Up as Test Cabinet For Radios Used at High Altitudes

MOBILE, Ala.—An eight-foot General Electric refrigerator which formerly saw service in a housewife's kitchen is doing yeoman duty in solving a serious problem at the Army four-engine flying field near here.

Undergoing transitional training for actual bombing work, pilots of the big bombers based at the field fly constantly above 30,000 feet, where the air is usually frigidly cold. When radios used for ship to ground communication went out of order, mechanics found in repairing them that they would function efficiently enough on the ground, but would "freeze up" at these lofty altitudes.

Examination of sets which refused to work at high altitude revealed that the metal mechanisms would stick, or thin coatings of oil would become sticky and stiff. There was no way of duplicating the cold until a mechanic hit on the idea of buying an old eight foot refrigerator, taking out the trays, and giving each radio a "freeze test" before re-installing it in the airplane. Now, the box is on duty 24 hours a day, accommodating two or three sets which are chilled to near zero, taken out and tested, and if still giving good service, are okayed for return to the plane. No radios have failed since this simple innovation went into effect.

There is A DIFFERENCE in SILICA GEL

ONLY DAVISON'S SILICA GEL HAS PROVEN PERFORMANCE

All silica gel is not alike! It may look alike but the real difference is in performance.

Davison developed Davison's Silica Gel for the refrigeration industry . . . it was perfected under close collaboration with refrigeration engineers. Every drying agent requirement they set up was taken into consideration and the result was a Superior Silica Gel that could be marketed to the refrigeration industry with confidence that it would out-perform not only any other drying agent . . . but any silica gel that was not manufactured expressly for the refrigeration industry.

Thus, the name Davison protects you! When you use Davison's Silica Gel you will be certain to get the Silica Gel results you have heretofore taken for granted.

Play safe. Avoid expensive and time-consuming call backs, freeze-ups, breakdowns. Specify and use Davison's Silica Gel. . . There is a difference.

THE DAVISON CHEMICAL CORPORATION
INDUSTRIAL CHEMICALS DEPARTMENT
BALTIMORE-1 • MARYLAND

ALWAYS ASK YOUR JOBBER FOR

DAVISON'S

Accelerated
SILICA GEL



LOOK FOR THE
DAVCO LABEL
...it's your protection against trouble

"DAVISON'S" ADVANTAGES

- 1—GREATER CAPACITY—1½ to 2 times as much as other types of drying agents.
- 2—ACTS INSTANTLY—No waiting, no delayed action in any system.
- 3—REMOVES ACIDS—Prevents formation of corrosive sludge.
- 4—WILL NOT DUST NOR POWDER—Refrigerant flows freely through entire system.
- 5—WILL NOT "CHANNEL" IN THE CARTRIDGE—Processed so that the refrigerant cannot pass through the cartridge without contacting Silica Gel.

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ENGINEERED TO YOUR EXPECTATIONS

BUNDY TUBING CO., DETROIT

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VACUUM PLATE
COOLING & FREEZING UNITS
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WATER COOLERS

Different models available for the various requirements of government agencies and war production plants.

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DRINKING WATER
SPECIALISTS FOR 40 YEARS.

REFRIGERATION
PARTS
NEEDED

● Idle and surplus inventories of refrigeration parts can now be put to essential use in helping to maintain the nation's huge investment in refrigeration.

We buy outright for cash, usable parts for distribution to over 20,000 refrigeration service-men customers. Let us put your idle inventories to good use—you will then be helping conserve scarce and precious materials.

The Harry Alter Co.
1728 So. Michigan Ave.
Chicago, Illinois

New Characteristics and Qualities Found Necessary In Insulation For Low Temperature Work

Must Be 'Compatible' With The Surfaces To Which It Is Attached, Stone Tells ASRE

CLEVELAND—Applications of low temperature test rooms and equipment in wartime industry and by Army research laboratories has focused new attention on insulating properties for this special kind of low temperature work, John F. Stone of Johns-Manville Corp. told members of the A.S.R.E. at their recent spring meeting here.

The following, according to Mr. Stone, are the principal "new" characteristics that insulation must have for such work:

(1) It must not be adversely affected by the lowest temperatures that will be encountered to the extent that it (a) become brittle, or (b) exert stress upon itself.

(2) It must be compatible with the material against which it is placed. The coefficient of expansion of the two materials must be alike, and the meeting of the two materials should not result in any corroding effect.

(3) Insulating material for such purposes must have the characteristic of the ability to be sealed against the entry of moisture. There must be

no permeability of moisture through the warm surface beyond the limit of two grains of moisture per square foot per day.

A further point, said Mr. Stone, is that in such applications as strato-chambers where there is a wide variation in the temperature range the insulation must act as something of a cushion against "thermal shock." The moisture that would get in the chamber if it were opened up for a warm-up period would be a complication of this problem of "thermal shock."

Questions 'Shock'

But it was pointed out by York Ice Machinery Corp.'s Chief Engineer John G. Bergdoll, in a discussion of the paper, that the "warm-up" phase in such chambers is accomplished by strip heaters of some such mechanical device, and the operation is such that the matter of "thermal shock" is not a problem.

For the purposes of his discussion, Mr. Stone considered low tempera-

tures to be 100° F. or more below the air surrounding the equipment or spaces to be insulated.

It is assumed that the objective in insulating, propounded Mr. Stone, is to provide for one or more of the following:

Objectives of Insulation

1. Economy of operation
2. Accurate control of process temperatures
3. Protection of equipment and surroundings by preventing condensation or frosting
4. Protection of equipment against thermal shock.

Economy of Operation

The cost of low temperature refrigeration is great enough to warrant careful analysis of all contributing factors, he pointed out.

The basic equation for most economical thickness of insulation which we have used was developed by the late L. B. McMillan. This equation is based on the proposition that as the thickness of insulation increases, the cost of refrigeration (M) decreases, but the cost of insulation (N) is increased. Hence the most economical thickness (x) is that at which M + N is a minimum. This is the McMillan equation:

$$x = \sqrt{\frac{ak}{b}} - R_k$$

k = conductivity of insulation, Btu. per in. per sq. ft. hr. °F.
b = cost of insulation in dollars per sq. ft. per year in. of thickness.

R = sum of all thermal resistances other than the insulation
Y (t₁ - t₂) M

a = 288000
in which Y = hours operation per year
t₁ = temperature of surrounding air
t₂ = temperature of equipment or space to be insulated
M = cost of refrigeration in dollars per ton day.

While it takes no extensive analysis to indicate that an expensive insulation needs to be highly efficient to be economical, the strictly economic determination frequently must be reviewed in regard to the second general objective, accurate control of process temperatures, said Mr. Stone. Table 1 shows some of the variations in heat flow into the refrigerated area, although in each case the most economical thickness of insulation is used.

It also emphasizes that with M constant, the most economical thickness of an insulation of one cost is not necessarily going to produce as low an overall operating cost as that of some other insulation of different cost. In Table 1, U is to be taken as over-all heat transfer in Btu. per sq. ft. per hr.

TABLE 1

M	k	t ₂ -t ₁	b	Y	x	U
\$0.60	.37	200	\$.015	7200	8.4"	8.6
0.60	.37	200	.025	7200	7.0	10.2
0.60	.37	200	.04	7200	5.25	13.5
0.60	.32	200	.015	7200	7.7	8.1
0.60	.32	200	.025	7200	6.3	9.8
0.60	.32	200	.04	7200	4.8	12.8
0.60	.27	200	.015	7200	7.1	7.4
0.60	.27	200	.025	7200	6.8	7.7
0.60	.27	200	.04	7200	4.4	11.8

McMillan's equation and the figures in this paper do not take into account the possible cost of variations from normal in structural design necessitated by the use of certain types of insulation. Such variations may make the total cost more or less and must be considered if a true cost is to be obtained.

Prevention of Condensation

In any area where high humidities prevail for considerable periods, the choice of thickness of insulation is usually governed by the amount necessary to prevent condensation on the outer surface, since that is nearly always greater than the most economical thickness taken under ordinary conditions.

The thickness needed to prevent condensation is found from the following equation plus knowledge of the minimum dew point depression to be considered:

$$\frac{t_1 - t_2}{R_1} = \frac{R_2 (t_1 - t_2)}{R_1}$$

where t₂ = temperature of surface of insulation
R₁ = surface thermal resistance
R₂ = total thermal resistance and other terms as before.

Since R₁ = R₂ + R₃ and x = thickness
R₁ = $\frac{x}{k}$ = conductivity

equation can be transformed to

$$x = R_2 k \left[\frac{(t_1 - t_2)}{(t_1 - t_2)} - 1 \right]$$

often a more convenient form as t₁ - t₂ can be taken as the minimum dew point depression anticipated.

It is not possible to prevent condensation by insulation alone at extremely high humidities, nor is it worthwhile to insulate against the worst conditions to be expected, the author showed.

The occasional need for protecting equipment against thermal shock is confined to those few instances where the operating cycle involves rapid and large temperature variations. In these cases insulation is preferably applied to both inside and outside of the equipment. Such special installations are not susceptible to any general analysis.

The characteristics a material must have to be used successfully at low temperatures are not limited to a low conductivity and a cost not too far out of line in view of the value of k. The relationship between those two points has been discussed but there is another that at times has to be considered, namely how much space is available. Limitation of overall dimensions might preclude the use of an inexpensive, relatively high conductivity insulant that appeared economically attractive.

Main Characteristics

Other important characteristics are:

1. Material not affected to a serious degree by the lowest temperature to which exposed.

This includes embrittlement and excessive internal stress. One widely used block type of insulation, when tested at the Johns-Manville Research Laboratories, exhibited decided spalling tendencies when warming up from -300° F. to room temperature.

2. Compatibility with surfaces to which applied.

Primarily this is the possession of a coefficient of thermal expansion reasonably close to that of the surface to be insulated. When the two coefficients differ too much, excessive stress is placed on any adhesive used and structural failure may result. In refrigeration insulation, structural failure usually means that a way is opened for the entrance of moisture followed by severe and spreading damage. Some tests at the Johns-Manville Research Laboratories gave the results shown in Table 2, average of five tests on each material.

3. Ability to be effectively sealed against moisture entry.

This is perhaps the most important characteristic. If this property is not possessed by the insulation, then the construction must be designed to provide an effective seal independently.

The Sealing Problem.

There is at least one type of installation where it seems that moisture sealing is not only unnecessary but if attempted would be disastrous. That is on the inside of "Strato-Chambers." Inside these chambers not only is a low temperature reached

(Concluded on Page 21, Column 1)



PRODUCT IMPROVEMENT IS IN THE AIR

TODAY our strategically-located factories are 100% on war work.

But even as we fight, Houdaille* management and engineers are anticipating the demands of the post-war world.

Out of this high-pressure war experience we are evolving new engineering and metallurgical concepts and improved production techniques which, in days to come, are bound favorably to affect the things you buy and use.

We will continue increasingly to provide

vital, precision parts to the automotive, aircraft, electrical refrigeration, radio, marine, railway equipment, and other important industries—but we will also make substantial contributions to industries yet unborn.

In every Houdaille division, product improvement is in the air—we are doing our share of forward thinking.

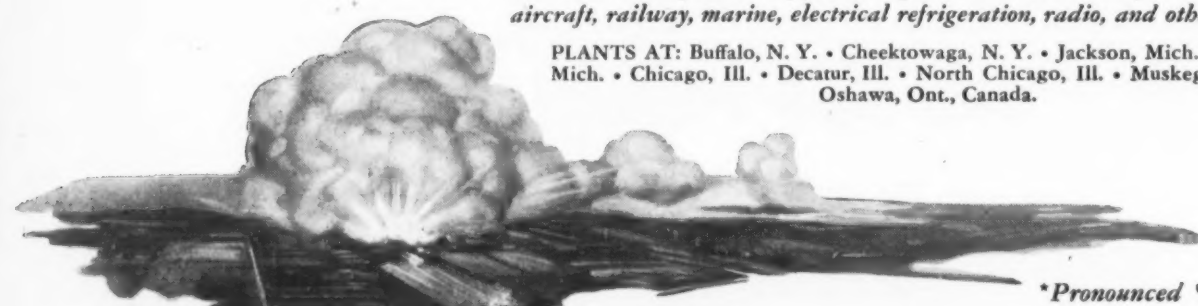
In your home, on land, sea or in the air—after this war is over—you will enjoy, more and more, the benefits of Houdaille's highly-specialized skills.



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Peacetime manufacturers of precision parts and mechanisms for the automotive, aircraft, railway, marine, electrical refrigeration, radio, and other industries.

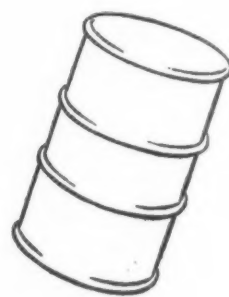
PLANTS AT: Buffalo, N. Y. • Cheektowaga, N. Y. • Jackson, Mich. • Detroit, Mich. • Chicago, Ill. • Decatur, Ill. • North Chicago, Ill. • Muskegon, Mich. • Oshawa, Ont., Canada.



*Pronounced "HOO-DYE"

METHYLENE CHLORIDE

Refrigeration Grade
Highest Purity



Important Don't let idle cylinders or drums hold up supplies now available. Empty all containers promptly. Look through your stocks and warehouses for any empty containers... and return them promptly

Pure... dry... uniform... manufactured to meet the rigid requirements of the refrigeration industry by du Pont, pioneer producer of Methylene Chloride and other popular refrigerants. Conditions permitting, current requirements for refrigeration purposes can be supplied, subject of course to the regulations of the War Production Board. Order what you need but please do not stock up unnecessarily. Electrochemicals Department, E. I. du Pont de Nemours & Co. (Inc.) Wilmington, Delaware.



METHYLENE CHLORIDE

BETTER THINGS for BETTER LIVING... THROUGH CHEMISTRY

Sealing Against Moisture Big Problem In Low Temperature Test Cabinet Jobs

(Concluded from Page 20, Column 5)
rapidly but a very low air pressure is attained.

If the inside were held at a low temperature steadily, or for long periods, there would be no point in sealing the insulation, since the seal should be on the warmer surface which is taken care of by the metal shell. During the warm-up part of the chamber cycle moisture is likely to enter the insulation. This must be countered by the use of materials not corroded or otherwise damaged by moisture and non-hygroscopic and without capillarity.

TABLE 2. COEFFICIENTS OF LINEAR EXPANSION

Temp. range	Change in length, per unit length per 1° F.
Material A 72°F. to -297°F.	1.9x10 ⁻⁶
J-M	
Rock Cork 72°F. to -308°F.	4.5x10 ⁻⁶
Material C 73°F. to -300°F.	33.9x10 ⁻⁶
For Comparison	
Steel (mild)	6.1x10 ⁻⁶
Concrete	8.0x10 ⁻⁶
Pine—parallel to fibre	3.0x10 ⁻⁶
Pine—perpendicular to fibre	19.0x10 ⁻⁶
Rubber (natural)	43.0x10 ⁻⁶

The use of a seal on the inner insulation surface is inadmissible because during the low-temperature, low-air-pressure period, the air contained in the insulation if confined would exert a pressure on the seal not very far short of a ton per sq. ft.

This is a very special case and it should be noted that it occurs only in connection with the insulation on the inside of the chamber, which is used primarily to protect the shell from sudden and large temperature changes. Insulation on the outside must be sealed and protected the same as that applied to any other low temperature vessel.

Except near the upper limit of the temperature range to which this discussion is confined, practically all insulation for low temperatures consists of applications to tanks, vessels, related equipment and piping.

Extra Burden

This places an extra burden on the protection afforded the insulation against moisture entry. The theory of the differential vapor barrier which has been discussed in a number of papers presented to the Society and widely elsewhere is not applicable, Mr. Stone averred.

That theory states that if the moisture vapor barrier on the warmer or high vapor pressure side of the insulation, is sufficiently less permeable than the colder or low vapor pressure side, there will be no accumulation of moisture turning into water or ice, within the insulation.

However, when the cold side has a permeability of zero it is apparent that the permeability on the warm side should be zero also or there will be gradual impairment of the insulation, the rate of change increasing as the value of the seal drops away from zero permeability, Mr. Stone stated.

Since workmanship is involved in the degree of tightness secured when sealing insulation jobs, it is not surprising that occasional failures are observed. Few if any of the insulants, as used, are more than very poor vapor barriers; consequently the use of extra thick insulation to allow for reduction of efficiency in service, is not a cure.

What are Limits

It will work with some success only on intermittently operating equipment when there is a drying-out period afforded when the inside temperatures rise to or above the surrounding air dew point. Even then, the insulant must be one that will withstand a wetting-drying cycle many times repeated.

Experience indicates that there can be some deviation from the theoretical necessity of a vapor seal having zero permeability. If this were not so but few of the installations made to date would have given more than a short period of useful service. However, this deviation or tolerance cannot be large. Probably the top is around 2.0 grains per sq. ft. per day, and even that, in areas of high humidity such as the Gulf Coast, would limit the useful life of the insulation to less than 10 years.

If it is admitted that the fallibility of workmanship makes attainment of the desired zero permeability barrier dubious, then a strong argument is presented for the use of insulations not seriously affected by moisture. Materials that swell, rust, disintegrate or rot when dampened require that the protective barrier be practically perfect.

This need for effective sealing of insulation extends equally over the whole low temperature range. In practice the maximum vapor pressure against the seal cannot be much over 36.0 mm. Hg. (saturation at about 90° F.), and it makes little difference what the low side temperature is. At -60° F. the maximum vapor pressure is near 0.0264 mm. Hg. so that regardless of how much below -60° F. the design temperature may be, the maximum pressure differential on the seal is not increased by more than 0.1%.

Discussion Brings Out Controversial Points

In the discussion of Mr. Stone's talk on "Insulation for Low Temperatures" Mr. Bergdoll of York Ice Machinery Corp. emphasized that in the ultra-low temperature applications discussed, compatibility of the insulation with the other surfaces in the enclosure is all-important.

"Insulation will expand and contract itself under the great differences in temperature, and so will the medium to which it is attached," said Mr. Bergdoll. "If there is an appreciable difference in the expansion and contraction of the two materials, the insulation might pull apart."

Mr. Bergdoll took issue with the author's point that insulation could well play a part in the control of process temperatures.

"In this respect," it was stated, "a large volume of heat gain is easier to control by a machine than a minute heat gain value."

With reference to the cost of insulation, it was pointed out that the contractor must figure in the erected cost of the insulation, not merely the "price" he pays for the insulation itself.

For practical purposes, said Mr. Bergdoll, men in the field had found that on such applications it was best to use a figure of 1.2 for the conductivity factor of insulation rather than the .3 factor generally used. The reason for going to four times the "textbook factor" is the consideration that must be given to joints, breakage in the insulation, and the infiltration of moisture that is caused by the differences in the vapor pressures involved.

In a written discussion Dr. Garner of Mellon Institute pointed to a type of insulating practice for such applications in which the insulation is contained between two concentric steel shells, with the insulating area dehumidified by Activated Alumina.

James G. McCormick of the American Flange & Mfg. Co. asked for consideration of reflective insulation for such applications, declaring that ordinary standards of computing insulation efficiency did not hold where reflective insulation was used.

Proper evaluation of reflective insulation, he declared, is in the number of sheets used, not on the thickness of the insulating material. He claimed that use of such insulation would bring about a decrease in the thickness required, and thus make possible more storage space. He asked the society to give further study to the possibilities of reflective insulation.

Farm Group Cites Need Of Repair Equipment

WASHINGTON, D. C.—The importance of a readily available supply of supplementary equipment such as pipe, pipe fittings, motors, etc., needed for the installation and repair of farm equipment was emphasized at the first meeting of the Farm Machinery and Equipment Suppliers Industry Advisory Committee, held recently in Washington with WPB officials and other Government agencies.

Ward Refrigerator Co. Gets Desirable Employees Through Radio 'Spot' Series

Sets People To Thinking About Work They Might Be Able To Do

LOS ANGELES—A new type of "Help Wanted" advertising that's proving remarkably effective because it reaches vast numbers of people who aren't actually looking for work has been developed by the Ward Refrigerator Co. here.

The medium is a "Help Wanted" radio program which is sponsored jointly by Ward and several business houses in other lines. The half-hour program which goes on the air twice daily over a network station dramatizes the employment opportunities offered by the Ward company and sets the advantages of working for the firm.

REACHES NEW GROUP

The company reports that numerous jobs which it had seemed almost impossible to fill are being taken in 24 hours or less as a result of the radio advertising. It's not at all uncommon to get a half-dozen or more excellent new people in a single day. The reason is obvious—because it forcibly brings employment opportunities to their attention, the radio program recruits many people who weren't working and hadn't particularly thought of going to work; also men beyond the draft age who were in non-essential industries and who needed a little encouragement in making a decision to switch over.

As Ward officials point out, people of this type don't usually read the classified ads or pay much attention

to signs. But when the right type of job is brought to their attention automatically, they're often impelled to take it. Such individuals usually make excellent employees because they're not thinking of competitive inducements. They aren't the type who cull all the job lists and interview dozens of employers in search of a "soft spot" or unusually high pay before making up their minds. They're good old-fashioned American workers who appreciate good working conditions and reasonable pay. They haven't bounced around the labor market until they're "spoiled."

TYPE OF PROGRAM

The Ward program, which incidentally is now being supplemented by scattered radio spot announcements that feature individual jobs, uses two announcers, one man and one girl. They alternate in reading "employment selling" copy. The dialogue is fast and interesting, sufficiently so to hold the interest of even a person who hasn't the faintest thought of looking for a new job.

In order to build a regular listener following among people who have been sold on the idea of working by the first broadcast or two but who haven't yet heard announcements of any jobs they feel they could handle, the copy is changed for every program. When the company needs workers in several different departments, mention is alternated from one to

another. Each time new selling appeals or new twists in old appeals are used.

Always the first part of the program features some of the tangible advantages of working for Ward. One time, copy made a patriotic appeal—the fact that it isn't enough to buy bonds, etc., that each individual can speed up the war effort by getting into the actual production line and that there's no better place to do it than at the Ward Refrigerator Co., which is engaged 100% in war production work. Again, working conditions were stressed. Another time, the opportunities for women were emphasized.

Every program mentions the fact that above-average wages are paid. But since the wage angle is no longer a competitive proposition, the main concentration is on other advantages of the jobs offered. The very nature of radio as an advertising medium makes it possible to do this with unusual effectiveness. The announcer can communicate interest and enthusiasm to the listener.

Obviously, two half-hour radio programs a day are expensive. But since the cost is split up among a half-dozen or so sponsors, it isn't at all prohibitive in view of results, according to Ward officials.

Dividend Is Declared By Nash-Kelvinator

DETROIT—Directors of Nash-Kelvinator Corp. at a meeting May 27, voted a dividend of 12½ cents per share on outstanding capital stock, payable June 25, to stock of record at the close of business on June 7.

"Refinement of detail marks the Difference between mediocrity and excellence." Anonymous.



SOME OF THE MANY REFINEMENTS IN THE DESIGN OF MARLO AIR UNITS

- 1 Marlo Self-Aligning Bearings with graphite bronze bushings are self-lubricating. They are equipped with quick-filling lubrication cups. Porous graphite feed plugs and oil grooves are fed from wool yarn packed double oil reservoirs, cast in the spherical bearing body.
- 2 Marlo Shaft Design embraces — as it conservatively must — generous cross section area and short bearing spans for speeds and loads encountered.
- 3 Marlo Sheaves are adjustable to suit variations in static pressure or loads.
- 4 Marlo Belt Guards are provided as standard on all Air Units.

HAVE YOU BOUGHT YOUR WAR BONDS TODAY?

MARLO COIL COMPANY
ST. LOUIS, MISSOURI

They're Set to Tie Up Some Loose Ends



C. T. Burg of Iron Fireman Mfg. Co. explains Indoor Climate Institute program to (seated) R. E. Moore, Bell and Gossett Co.; J. M. McClintoc, Illinois Iron and Bolt Co.; J. R. Scott, Mueller Furnace Corp.; (standing) Everett N. McDonnell, McDonnell and Miller; P. B. Zimmerman, Airtemp division, Chrysler Corp.; C. D. Lyford, Minneapolis-Honeywell.

Indoor Climate Institute Program Would Set Up Standards, Promote Local Bureaus

(Concluded from Page 1)

ing and air conditioning equipment, and it has not yet been sold on good heating and air conditioning as a sound value.

By combining its educational and promotional efforts, the industry as a unit can give the public one single strong story without the usual conflict of individual advertising. This story will be of news interest and will be well supported by the press, because it will permit the publishers to promote this great new development without being partial to any one interest.

In presenting an outline of the Indoor Climate Institute program Mr. Zimmerman called attention to the success of several other national educational programs. One of the most successful ever undertaken was the "Better Light—Better Sight" program, established by several hundred manufacturers of portable lamps. By adopting the "I. E. S." label for lamps meeting high standards, and by gaining the support of schools, colleges, medical people, and the Eyesight Conservation Council, this group was able to obtain the support of the larger stores. The result was the increased sale of better lamps, based on the public demand for good lighting.

A similar program was carried out by the Reflector and Lamp Manufacturers in the industrial lighting field. This group eliminated expensive and unnecessary technical engineering services which had been a part

of every lighting installation, and at the same time gave the industrialist a simple formula for obtaining good lighting which he could understand. The effect was to eliminate many undesirable practices in the commercial lighting industry.

POINT TO OTHER FIELDS

Household refrigeration was not "sold" to the public until the industry finally banded together in 1926 to form the Food Preservation Council. Adopting the slogan, "Below Fifty Degrees Lies Safety" the group obtained the help of national magazines, the trade press, schools, utilities, and other institutions in teaching the American housewife the importance of food preservation. Attaining a phenomenal success, sales rose from less than 300,000 refrigerators in 1926 to over three million in 1940. Sales of ice refrigerators were also greatly improved during this period.

Still another important cooperative program was the "Red Seal" wiring campaign. This was designed to elevate the wiring standards throughout the country by placing a "Red Seal" on all meters where the building was equipped according to approved standards. Under this program, pull-chain fixtures were eliminated and service outlets were placed between all large openings in a home, providing proper outlets for the many appliances that have been used by the American housewife in recent years.

Finally the "Modern Kitchen Bureau" was established to sell "style" to the American home and to set new standards in the kitchen. This promotional program had a real influence on improving standards in the home kitchen, and of building a market for refrigerators, ranges, kitchen cabinets, dish washers, and garbage disposal units.

SEALS AND STANDARDS

The Indoor Climate Institute (I. C. I.) contemplates the issuance of identification seals; the national organization to present them to manufacturers of automatic heating and air conditioning equipment meeting I. C. I. standards; the local organizations to present them to installing dealers and contractors handling work in accordance with the best established local practice. It is expected that equipment standards will be established by the various associations now doing a vast amount of research work on problems of this kind and that installation standards will be set according to the best local practice, to meet all safety codes and ordinances.

Local Bureaus established under the national Indoor Climate Institute program will provide a consulting service for home owners, dealers, contractors, architects, engineers, and builders. The local Bureau will check plans to see that the heating system is to be installed according to the best known practice, and advise people interested as to necessary changes.

PLAN SERIES OF MEETINGS

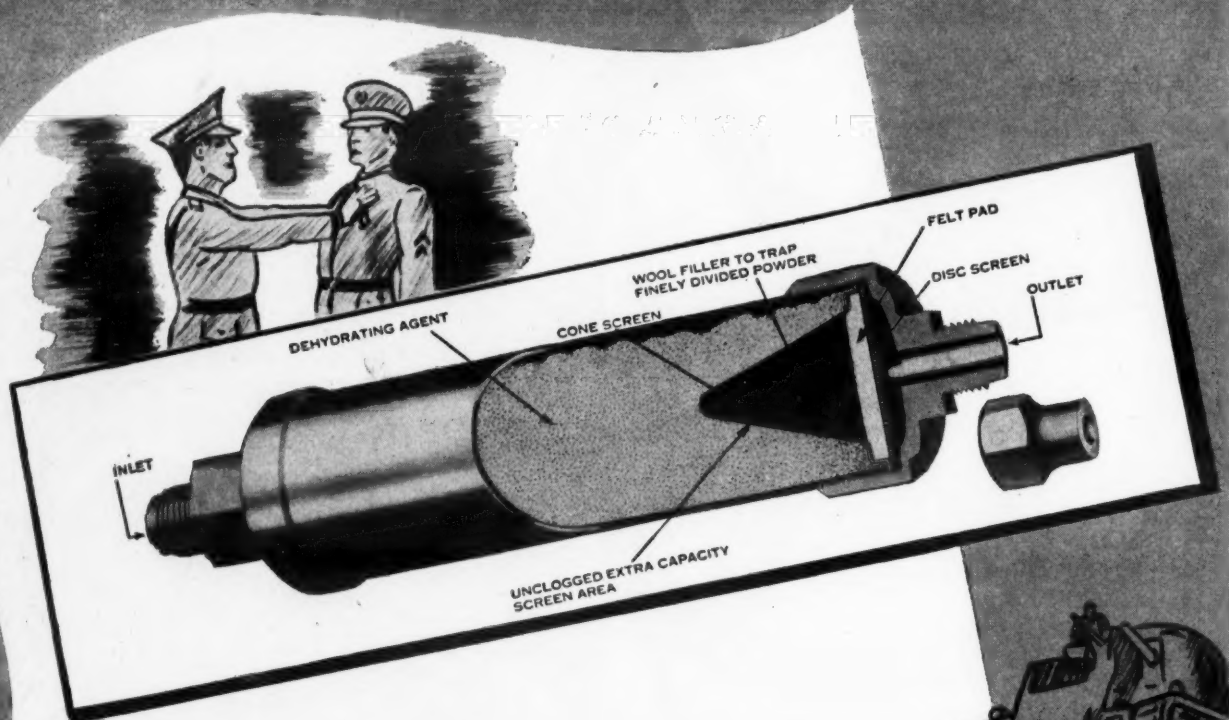
Meetings will be held in all principal cities to acquaint the local trade and building interests with the I. C. I. program. These meetings will be conducted by field specialists employed by the national organization and will serve to raise the standards of the entire heating industry.

To interest a higher type of personnel in heating work in the post war era, the Indoor Climate Institute will cooperate with the national associations in the issuance of manuals and training courses used in the industry. The Educational Director of I. C. I. will also seek to establish training courses at colleges, universities, night schools, Y. M. C. A. schools, and with other educational institutions. It is expected that the splendid work now being done at the University of Illinois and at Michigan State College can be expanded to many other educational institutions.

The national I. C. I. office will issue publicity that can be used in national magazines, newspapers, and by the business press. Local organizations will also serve as centers for issuing publicity that will be of interest to the local press. All campaigns will be carefully prepared to give the people complete information about improvements that have been made in indoor comfort.

Commercial REFRIGERATION
Modern Display Cases
Coolers, Refrigerators
AMANA SOCIETY, AMANA, IOWA

ALCO For Maximum Evaporator Efficiency
ALCO VALVE CO. ST. LOUIS, MO.



FOR Efficient Service

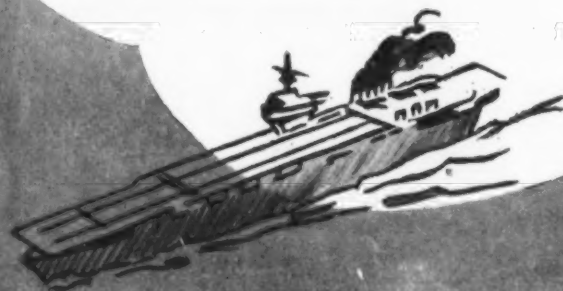
● Mueller Brass Co. dehydrators are provided with a special cone screen and other advantageous features which assure greatly increased efficiency in service (note illustration above.)

When a dehydrator is in operation there is a tendency for small particles of its drying agent to lodge on the face of the outlet filter. This condition will increase, particularly with dehydrators furnished with the old style flat disc screens, until the line is greatly restricted through clogging.

Restriction results in pressure drop, causing some evaporation of the liquid into gas. This mixture of liquid and gas causes trouble at the expansion valve. A decided temperature drop at the outlet of the dehydrator is an indication to the service man of this trouble.

The Mueller Brass Co. improved dehydrator is designed to correct this condition. The cone-shaped screen, filled with pure wool, directs the fine particles of the drying agent to the outside of the base of the cone. Any particles that get through the screen will lodge in the wool filler without clogging, leaving the center free for the passage of the refrigerant.

Mueller Brass Co. dehydrators are furnished in all practical styles and sizes—heavy copper shell and forged brass ends soldered in place. Write us for illustrated descriptive literature.



**MUELLER
BRASS CO.**
PORT HURON, MICH.

REFRIGERATION PRODUCTS
fedders
BUFFALO, N. Y.

MASTER FOOD CONSERVATORS

have the call. This Modern Food Conservator has many unusual advantages. Sold through distributors of refrigeration and insulation.

Get our proposition
MASTER MANUFACTURING CORP.
121 Main St. Sioux City, Iowa

Continental
FARM LOCKER PLANT
SANITARY REFRIGERATOR CO.
FOND DU LAC, WISCONSIN

FREEZING OVEN and FREEZING SHOWER

The successor to the Pipe Coil for low Temperature (below 32°)

KRAMER TRENTON G.
Heat Transfer Products
TRENTON, N. J.

Seamless
PENN BRASS and COPPER TUBING
PENN. BRASS & COPPER CO.
EAST PENNA.

VISOLEAK

SAVES time—SIMPLIFIES leak detection problems—CONSERVES refrigerant.

VISOLEAK reveals "hard to find" leaks of all refrigerants. Add 4 oz., plus an extra ounce for each 10 lbs. of refrigerant, to system.

4 ounces, \$1.00; 8 ounces, \$1.75. Pint, \$3; Quart, \$5; Gallon, \$16.

Buy from your Jobber or write to

Western Thermal Equipment Co.

5141 Angeles Vista Blvd. - Los Angeles, Calif

Electromatic
Automatic Control Valves and Regulators
2100 Indiana Ave., Chicago, Ill.

UNIVERSAL COOLER
MARION, OHIO BRANTFORD, ONTARIO
WE SELL TO MANUFACTURERS ONLY
UNIVERSAL COOLER CORPORATION
Automatic Refrigeration since 1922

Use **CHICAGO SEALS** for seal replacements
A complete line in all sizes
CHICAGO SEAL CO.
20 North Wacker Dr., Chicago

PAR COMMERCIAL REFRIGERATION UNITS FOR PROTECTION OF VITAL FOOD SUPPLIES
See Your Par Jobber
LYNCH MANUFACTURING CORP.
DEFIANCE, OHIO, U.S.A.

For: TRUCKS, LOCKERS, COOLERS, COUNTERS, CABINET CONVERSIONS, etc.

KOLD-HOLD PLATES

KOLD-HOLD MFG. CO.
LANSING, MICH., U.S.A.

The Priorities Quiz

(AIR CONDITIONING & REFRIGERATION NEWS, with the aid of a man who is actually engaged in handling much priorities work, will attempt to answer questions from readers about priorities problems. The editors will not guarantee to answer all questions, nor can they guarantee that the answers will be legally perfect, but an effort will be made to provide a guide to correct procedure wherever possible.)

AA-2 Is Now High Production Rating

Q. For the second quarter of 1943 we were given by the War Production Board a "AA-1" rating for the purchase of production materials for the manufacture of refrigeration repair parts. For the third quarter, we have been assigned an "AA-2" rating for the same purpose. Does this indicate that refrigeration repair is now receiving less consideration by the WPB?

A. No. The repair of facilities is still highly regarded by the WPB. You will recall that a number of months ago the rating "AA-2" was given an equal position with "AA-1" and that the rating "AA-2X" was substituted for "AA-2." The WPB has now reinstated the rating "AA-2" in its original second place position but are attempting to eliminate the "AAA" rating which will thus elevate all of the ratings one full grade. This being the case, the "AA-2" rating which you have received for the third quarter is actually equal to the "AA-1" rating you received for the second quarter. Only "critical component parts" primarily scheduled for military uses are receiving the "AA-1" ratings from now on. You should see a great many more "AA-2" ratings in the near future than you will "AA-1" ratings. The "AA-2" ratings you have been assigned by the WPB should get you the material you are after.

Repairs Still Covered If 'P' Orders Are Dropped

Q. I saw a statement recently that the War Production Board's "P" orders are soon to be revoked. Do you know which of the orders will be included and if P-126 will also be revoked? If this is true, will it not seriously affect our ability to secure refrigeration repair parts?

A. It is true that the WPB will eliminate more of the "P" orders. It is not their intention, however, to in any way affect your ability to secure repair parts by this action, nor is it definitely determined that P-126 will be one of the "P" orders to be withdrawn. However, CMP Regulation No.

5 now gives ratings for the procurement of repair materials to many types of businesses now also covered by the "P" order series. You will find on reading CMP Regulation No. 5 that the rating AA-5 has been assigned rather broadly for necessary maintenance or repair of facilities which, in the words of WPB, in CMP Regulation No. 5 are "required for producing any product or conducting any business not listed in Schedule I or Schedule II."

Change In Procedure For 'B' Producers

Q. We manufacture "B" products under the Controlled Materials Plan. We have recently received requests from several of our customers asking for detailed Bills of Materials. It is our understanding that because "B" product manufacturers receive materials directly from the War Production Board that they are not required to give detailed Bills of Materials to their customers. We have been advised by our customers that there is some change in this procedure. Do you have some information that you can give us on this question?

A. The War Production Board has recently issued a revised booklet of "Instructions on Bills of Materials" dated May 15, 1943. One of the principal changes is that manufacturers of military end items may now request on all parts regardless of whether or not they are "A" or "B" products or contain controlled or non-controlled materials a complete detailed Bill of Materials in which you must furnish a detailed break-down as to all material specifications and weights.

This new provision will, undoubtedly, mean a great deal more paper work for "B" product manufacturers. The natural result has been a flood of protests to the War Production Board. The major claimant agencies interested in military items, however, claim these detailed Bills of Materials are necessary in the complete scheduling which they hope to adopt. While it is possible that with the flood of protests now being sent to the War Production Board—a modification may result; you are, nevertheless, required as the rules now stand, to furnish your customers with these detailed Bills of Materials.

New Instructions Are Detailed For the Preparation of Bills of Materials

WASHINGTON, D. C.—Instructions for preparing Bills of Materials under the Controlled Materials Plan have been simplified, says WPB.

In issuing the instruction booklet, which supersedes General Instructions on Bills of Materials published Nov. 14, 1942, Walter C. Skuce, Director of the Controlled Materials Plan Division, said: "These instructions have been revised by the War Production Board Controlled Materials Plan Division, in cooperation with the various Claimant Agencies, including the Army and the Navy, and with representatives of industry."

"No new forms are required by the revised instructions for Bills of Materials, and with the exception of a provision with respect to complete Bills of Materials, there has been no major change—the principal purpose of the revision being to clarify the instructions and make them simpler for industry to use in preparing proper bills."

"The accuracy with which Bills of Materials are filled out determines the accuracy with which WPB may allot materials to war production programs. As a consequence, industry cannot be urged too strongly to provide complete and accurate Bills of Materials whenever requested to do so."

The new instructions authorize Claimant Agencies to obtain Complete Bills of Materials on major repetitive products such as airplanes, tanks and guns. It is pointed out that if a pro-

ducer is asked to submit a Complete Bills of Materials, he must show the requirements for the manufacture of Class B components as well as for the manufacture of Class A components. This constitutes a major change from past practice under which material requirements for Class B components could not be required in Bills of Materials.

The booklet defines a Bill of Materials as "a statement of the materials required to produce a given product, assembly, sub-assembly, or part." The distinction is retained between a Detail Bill of Materials showing all materials required for each individual part or product, and a Summary Bill of Materials indicating total quantities of each CMP material required for fabrication of the product, and in addition the time the various materials are required ("lead time") in order for a manufacturer to meet his production schedule. Complete instructions for filing both Detail Bills of Materials and Summary Bills are in the new booklet.

The booklet spells out in detail the method of estimating lead time which must be entered on Form CMP-1, Summary Bill of Materials, and for Class B products and items of Government Furnished Equipment on Form CMP-3. It is pointed out that no lead time on materials need be entered on Form CMP-2, covering the Detail Bill of Materials.

Copies of the Bill of Materials are available at WPB field offices.

'Guide Book' Offered On Copper & Brass Work

NEW YORK CITY—The Eastern Brass and Copper Co., 515 Greenwich St., here has recently published a new catalog and guide book to be distributed to war production companies using Eastern brass and copper products.

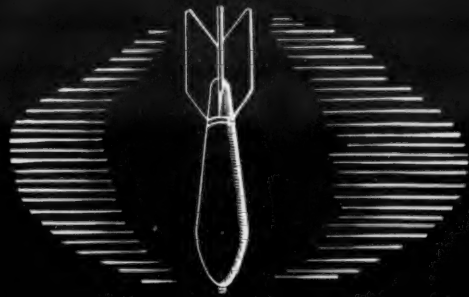
A complete table of weights and measures, a copper and copper alloy digest, all government specifications and other miscellaneous items are contained in the book, as well as the usual general outline of stock.

According to an announcement made by the company, this book is unique in that it is the only one of its kind to include all of the essential copper and brass information by mill fabricators. All war contractors can obtain copies by writing to W. E. Bargar, advertising manager of the Eastern Brass and Copper Co., 515 Greenwich St., New York City.

Data Is Presented on Zinc Plated Steel Sheet

PERU, Ill.—Facts about zinc plated steel sheet, produced by the American Nickeloid Co., are presented briefly in a folder recently made available by the company to persons interested in this rust-resistant metal.

Zinc plated steel sheet, made by electroplating zinc onto a steel base, resists corrosion and serves as a substitute for nickel, tin, aluminum, brass, or copper, and a number of plated metals, the company states.



Who Wins Wars?

Strangely enough, you do! Much as we all detest war the fact is that under its stimulation a nation always develops new products with infinite peacetime applications. Look at the radio and the airplane! To date, scores of fantastic devices have been created for war purposes which later will contribute mightily to the pleasure of your life. And just as we've helped build the cars and refrigerators you own today, Weatherhead will one day help build for you these amazing new products of the future.

Look Ahead with 

Weatherhead

THE WEATHERHEAD COMPANY, CLEVELAND, OHIO
Manufacturers of vital parts for the automotive, aviation, refrigeration and other key industries.

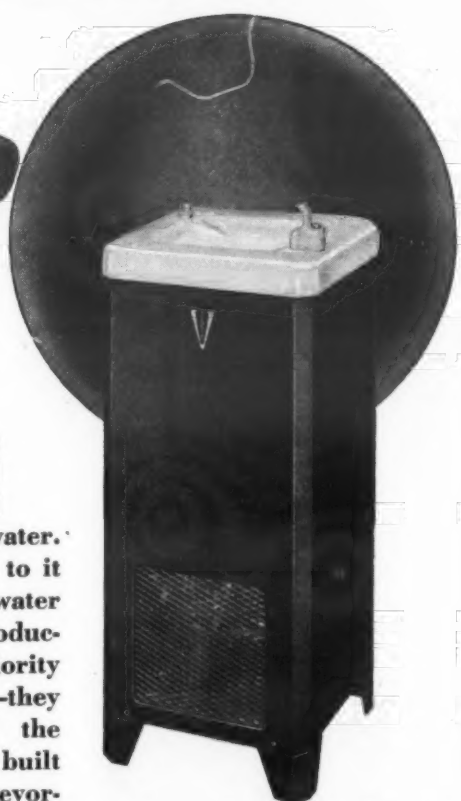
Plants: Cleveland, Columbia City, Ind., Los Angeles
Canada—St. Thomas, Ontario

A CUE TO INCREASED PRODUCTION!



OASIS Electric Water Coolers

Nothing brings "production pep" back to thirst-fatigued workers as quickly, safely and healthfully as properly cooled water. And OASIS Electric Coolers see to it that every worker gets drinking water at its best! These "allies of production" have proved their superiority in hundreds of installations—they are designed by pioneers in the electric water cooler field, and built in one of the best equipped conveyor-line production plants in the industry. If you have priority requests for water coolers, get in touch with EBCO today!



The EBCO Manufacturing Company
401 W. Town St., Columbus, Ohio

Text of Order Setting Icebox Prices

Because it is sometimes difficult to get copies of the complete texts of various government orders, the NEWS has published the complete text of all orders which may in any way affect the business operations of its readers. Since a number of dealers are now handling ice refrigerators, this information is presented on icebox price ceilings.

Maximum Price Regulation 399— New Ice Boxes Contents

Sec.

- 1 What ceiling prices are fixed by this regulation.
- 2 Ceiling prices for sales of new ice boxes at retail.
- 3 Ceiling prices for wholesalers.
- 4 Taxes.
- 5 Sales for export.
- 6 Credit and other charges.
- 7 Tagging.
- 8 Sales slips, receipts, and invoices.
- 9 Enforcement.
- 10 Petitions for amendment.
- 11 Applicability of the General Maximum Price Regulation.
- 12 Licensing and registration.
- 13 Geographical applicability.
- 14 Table A: Retail ceiling prices in each State for sales of ice boxes by ice companies and retail establishments controlled by ice companies.
- 15 Table B: Retail ceiling prices for sales of ice boxes by mail order houses when selling from a mail order catalog.
- 16 Table C: Ceiling prices in each State for all other sales of ice boxes at retail.

Section 1. What ceiling prices are fixed by this regulation. This regulation fixes ceiling prices for sales of new ice boxes at retail (including sales by mail order houses and ice companies) and at wholesale. A sale at retail is a sale by a person other than the manufacturer to a person who buys for use. A sale at wholesale is a sale by a person other than the manufacturer to a person who buys for resale. Sales by manufacturers are covered by Maximum Price Regulation No. 188. Ice boxes not listed in the tables below unless an order has been issued under this section establishing ceiling prices for such sales. Orders will be issued by the Office of Price Administration, Washington, D. C., upon application.

Sec. 2. Ceiling prices for sales of new ice boxes at retail. Ceiling prices for the various makes and models of ice boxes for sale at retail are listed below in Tables A, B, and C.

Table A, set forth as section 14, lists retail ceiling prices for sales by ice companies and by retail establishments controlled by ice companies. No amount may be added to the ceiling prices listed in Table A for delivery to the buyer.

Table B, set forth as section 15, lists ceiling prices for mail order sales by mail order houses. The prices listed in Table B are f.o.b. shipping point.

Table C, set forth as section 16, lists ceiling prices for all other sales of ice boxes at retail, including sales by a retail store of a mail order house. No amount may be added to the ceiling prices listed in Table C for delivery to the buyer.

Sec. 3. Ceiling prices for wholesalers. Ceiling prices for sales at wholesale are 60% of the retail base price as shown in Column I of Table C plus the difference between the base price and the retail ceiling price for the state in which the wholesaler's warehouse is located. The wholesaler's ceiling price is f.o.b. warehouse.

Sec. 4. Taxes. Any tax upon or incident to the sale of a new ice box may be added to the ceiling prices established by this regulation, provided that the tax is separately stated and charged.

Sec. 5. Sales for export. The ceiling price at which a person may export any new ice box is established by the provisions of the Second Revised Maximum Export Price regulation.

Sec. 6. Credit and other charges. Charges for the extension of credit may be added to the maximum retail prices established by this regulation only to the extent permitted by this section. All such charges shall be quoted and billed separately.

(a) Sellers who in March 1942 separately stated and collected an additional charge for the extension of credit on sales of ice boxes or like articles may collect a charge for the extension of credit on sales under this regulation. The charge collected must not exceed the charge in March 1942 on a similar sale to the same class of purchaser. Other sellers may make a charge for the extension of credit only on installment-plan sales, not on charge-account sales. The charge shall not exceed the additional charge separately stated and collected for the extension of similar credit in March 1942 by the seller's closest competitor who made such a charge.

An installment-plan sale, as used in the above paragraph, means a sale where the unpaid balance is to be paid in installments over a period of (1) six weeks or more from the date of sale in the case of weekly installments or (2) eight weeks or more in the case of other than weekly installments.

(b) Any charge which is not quoted and billed separately in connection with the sale of an ice box, whether for credit or otherwise, shall, for the purposes of this regulation, be considered to be part of the price charged for the article sold.

(c) No seller may require as a condition of sale that the purchaser must buy on credit, or buy accessories or any other commodity or service.

Sec. 7. Tagging. No person shall sell or offer to sell a new ice box at retail unless a tag is attached to the ice box which states the manufacturer's name or the brand name, the model, the rated ice capacity, ceiling price and selling price. A tag in the following form is satisfactory:

Make or brand.....

Model..... Ice capacity.....

Ceiling price.....

Selling price.....

This tag must not be removed before delivery to the purchaser.

Sec. 8. Sales slips, receipts and invoices. Every person selling a new ice box in the course of trade or business shall furnish the buyer with a sales slip, receipt, invoice or other writing, stating the date of the sale, the make or brand and model, the price charged, the nature and amount of any additional charges (which must be separately stated) and the name and address of the buyer. A copy of such sales slip, receipt, invoice, or other writing shall be kept by the seller, and the original shall be kept by any buyer in the course of trade or business, for inspection by the Office of Price Administration.

SEC. 14 Table A: Retail Ceiling Prices in Each State for Sales of Ice Boxes by Ice Companies and Retail Establishments Controlled by Ice Companies. No amount may be added to these ceiling prices for delivery to the buyer.

Manufacturer	Brand	Model	Ice cap.	Ala.	Ark.	Calif.	Colo.	Conn.	Del.	D. C.	Fla.	Ga.	Idaho	Ill.
Alaska Refrigerator Co.		A-75	Lbs.	\$31.25	\$31.25	\$32.00	\$31.25	\$32.00	\$31.25	\$31.25	\$31.25	\$31.25	\$32.00	\$31.25
American Fixture & Mfg. Co.		A-285		75	57.25	57.25	58.25	57.25	57.25	57.25	57.25	57.25	57.25	57.25
Atkins Table & Cabinet Co.		300		75	42.50	42.50	44.00	42.50	42.50	42.50	42.50	42.50	42.50	42.50
Brunswick Refrigerator Co.		308		75	39.75	39.75	40.25	39.75	39.75	39.75	39.75	39.75	40.75	39.75
Coleman Furniture Co.		VC-75		75	74.75	74.75	77.25	75.25	75.25	75.25	75.25	75.25	77.25	75.25
Colson Metal Products Co.		EM-75		75	57.25	57.25	57.25	57.25	57.25	57.25	57.25	57.25	57.25	57.25
Cooler Corp., The		V-6		75	66.25	66.25	68.00	67.50	67.50	67.50	67.50	67.50	67.50	66.25
Dean, Geo. H., Inc.		D-75		75	65.50	65.50	67.50	66.25	65.50	65.50	65.50	65.50	67.50	65.50
Dratch's Victory Ref. Box		333		75	41.25	41.25	42.25	41.25	41.25	41.25	41.25	41.25	42.25	41.25
Fy-Boro Metal Products Co., Inc.		650		75	42.00	42.00	43.00	42.00	42.00	42.00	42.00	42.00	43.00	42.00
Ice Cooling Appliance Corp.		V-50		50	41.25	41.25	41.50	41.25	41.25	41.25	41.25	41.25	41.25	41.25
Ice Cooling Appliance Corp.		V-75-D		75	57.25	57.25	58.50	57.25	57.25	57.25	57.25	57.25	58.25	57.25
Ice Cooling Appliance Corp.		V-3		50	41.25	41.25	41.50	41.25	41.25	41.25	41.25	41.25	41.25	41.25
Ice Cooling Appliance Corp.		V-41		75	57.25	57.25	58.50	57.25	57.25	57.25	57.25	57.25	58.25	57.25
Iceland Refrigerator Co., Inc.		700		75	38.25	38.25	38.75	38.50	38.50	38.50	38.50	38.50	39.50	38.25
King Refrigerator Corp.		A		75	43.50	43.50	44.00	43.50	43.50	43.50	43.50	43.50	44.00	43.50
Maine Manufacturing Co.		1557		40	26.75	26.75	27.25	26.75	26.75	26.75	26.75	26.75	27.25	26.75
Maine Manufacturing Co.		1558		50	31.25	31.25	32.25	31.50	31.25	31.25	31.25	31.25	32.25	31.25
Maine Manufacturing Co.		1559		75	37.00	37.00	38.50	37.25	37.00	37.00	37.00	37.00	38.50	37.00
Maine Manufacturing Co.		2057		40	31.25	31.25	32.00	31.25	31.25	31.25	31.25	31.25	32.00	31.25
Maine Manufacturing Co.		2058		50	35.75	35.75	37.00	36.00	35.75	35.75	35.75	35.75	37.00	35.75
Maine Manufacturing Co.		2059		75	39.50	39.50	41.00	40.00	39.50	39.50	39.50	39.50	41.00	39.50
Maine Manufacturing Co.		2258		50	42.00	42.00	43.00	42.00	42.00	42.00	42.00	42.00	43.00	42.00
Maine Manufacturing Co.		2259		75	46.25	46.25	48.00	46.75	46.25	46.25	46.25	46.25	48.00	46.25
Modern Ref. Co. (N. Y.)		100		75	42.00	42.00	43.00	42.00	42.00	42.00	42.00	42.00	43.00	42.00
Modern Ref. Works (Cal.)		D-60		50	46.75	46.75	48.00	47.25	46.75	46.75	46.75	46.75	48.00	46.75
Modern Ref. Works		D-30		50	34.95	34.95	36.00	34.95	34.95	34.95	34.95	34.95	36.00	34.95
Modern Ref. Works		D-50		50	46.75	46.75	48.00	47.25	46.75	46.75	46.75	46.75	48.00	46.75
Modern Ref. Works		M-75		75	56.95	56.95	58.50	58.25	56.95	56.95	56.95	56.95	58.50	56.95
Progress Ref. Co.		50		50	64.75	64.75	66.25	64.75	64.75	64.75	64.75	64.75	66.25	64.75
Progress Ref. Co.		75		75	75.00	75.00	77.50	75.00	75.00	75.00	75.00	75.00	77.50	75.00
Sanitary Ref. Co.		MV-2125		75	49.75	49.75	51.25	49.75	49.75	49.75	49.75	49.75	51.25	49.75
Sanitary Ref. Co.		MV-2126		75	57.50	57.50	59.00	57.50	57.50	57.50	57.50	57.50	59.00	57.50
Seeger Ref. Co.		V-75		75	65.50	65.50	67.25	66.25	65.50	65.50	65.50	65.50	67.25	65.50

SEC. 14 Table A—Continued.

Manufacturer	Brand	Model	Ice cap.	Ind.	Iowa	Kans.	Ky.	La.	Maine	Md.	Mass.	Mich.	Minn.	Miss.
Alaska Refrigerator Co.		A-75	Lbs.	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25
American Fixture & Mfg. Co.		A-285		75	57.25	57.25	57.25	57.25	57.25	57.25	57.25	57.25	57.25	57.25
Atkins Table & Cabinet Co.		300		75	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50
Brunswick Refrigerator Co.		308		75	39.75	39.75	40.00	39.75	39.75	39.75	39.75	39.75	40.75	39.75
Coleman Furniture Co.		VC-75		75	74.75	74.75	77.25	75.25	75.25	75.25	75.25	75.25	77.25	75.25
Colson Metal Products Co.		EM-75		75	57.25	57.25	57.25	57.25	57.25	57.25	57.25	57.25	57.25	57.25
Cooler Corp., The		V-6		75	66.25	66.25	68.00	67.50	67.50	67.50	67.50	67.50	67.50	66.25
Dean, Geo. H., Inc.		D-75		75	65.50	65.50	67.50	66.25	65.50	65.50	65.50	65.50	67.50	65.50
Dratch's Victory Ref. Box		333		75	41.25	41.25	42.25	41.25	41.25	41.25	41.25	41.25	42.25	41.25
Fy-Boro Metal Products Co., Inc.		650		75	42.00	42.00	43.00	42.00	42.00	42.00	42.00	42.00	43.00	42.00
Ice Cooling Appliance Corp.		V-50		50	41.25	41.25	41.50	41.25	41.25	41.25	41.25	41.25	41.25	41.25
Ice Cooling Appliance Corp.		V-75-D		75	57.25	57.25	58.50	57.25	57.25	57.25	57.25	57.25	58.25	57.25
Ice Cooling Appliance Corp.		V-3		50	41.25	41.25	41.50	41.25	41.25	41.25	41.25	41.25	41.25	41.25
Ice Cooling Appliance Corp.		V-41		75	57.25	57.25	58.50	57.25	57.25	57.25	57.25	57.25	58.25	57.25
Iceland Refrigerator Co., Inc.		700		75	38.25	38.25	38.75	38.50	38.50	38.50	38.50	38.50	39.50	38.25
King Refrigerator Corp.		A		75	43.50	43.50	44.00	43.50	43.50	43.50	43.50	43.50	44.00	43.50
Maine Manufacturing Co.		1557		40	26.75	26.75	27.25	26.75	26.75	26.75	26.75	26.75	27.25	26.75
Maine Manufacturing Co.		1558		50	31.25	31.25	32.25	31.50	31.25	31.25	31.25	31.25	32.25	31.25
Maine Manufacturing Co.		1559		75	37.00	37.00	38.50	37.25	37.00	37.00	37.00	37.00	38.50	37.00
Maine Manufacturing Co.		2057		40	31.25	31.25	32.00	31.25	31.25	31.25	31.25	31.25	32.00	31.25
Maine Manufacturing Co.		2058		50	35.75	35.75	37.00	36.00	35.75	35.75	35.75	35.75	37.00	35.75
Maine Manufacturing Co.		2059		75	39.50	39.50	41.00	40.00	39.50	39.50	39.50	39.50	41.00	39.50
Maine Manufacturing Co.		2258		50	42.00	42.00	43.00	42.00	42.00	42.00	42.00	42.00	43.00	42.00
Maine Manufacturing Co.		2259		75	46.25	46.25	48.00	46.75	46.25	46.25	46.25	46.25	48.00	46.25
Modern Ref. Co. (N. Y.)		100		75	42.00	42.00	43.00	42.00	42.00	42.00	42.00	42.00	43.00	42.00
Modern Ref. Works (Cal.)		D-60		50	46.75	46.75	48.00	47.25	46.75	46.75	46.75	46.75	48.00	46.75
Modern Ref. Works		D-30		50	34.95	34.95	36.00	34.95	34.95	34.95	34.95	34.95	36.00	34.95
Modern Ref. Works		D-50		50	46.75	46.75	48.00	47.25	46.75	46.75	46.75	46.75	48.00	46.75
Modern Ref. Works		M-75		75	56.95	56.95	58.50	58.25	56.95	56.95	56.95	56.95	58.50	56.95
Progress Ref. Co.		50		50	64.75	64.75	66.25	64.75	64.75	64.75	64.75	64.75	66.25	64.75
Progress Ref. Co.		75		75	75.00	75.00	77.50	75.00	75.00	75.00	75.00	75.00	77.50	75.00
Sanitary Ref. Co.		MV-2125		75	49.75	49.75	51.25	49.75	49.75	49.75	49.75	49.75	51.25	49.75
Sanitary Ref. Co.		MV-2126		75	57.50	57.50	59.00	57.50	57.50	57.50	57.50	57.50	59.00	57.50
Seeger Ref. Co.		V-75		75	65.50	65.50	67.25	66.25	65.50	65.50	65.50	65.50	67.25	65.50

SEC. 14 Table A—Continued.

Manufacturer	Brand	Model	Rated ice capacity	Base price	Mo.	Mont.	Nebr.	Nev.	N. H.	N. J.	N. M.	N
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Tables of Dollars-and-Cents Prices on Iceboxes

Sec. 16 Table C: Ceiling Prices in Each State for All Other Sales of Ice Boxes at Retail. No amount may be added to these ceiling prices for delivery to the buyer.

Manufacturer	Brand	Model	Rated ice capacity	Retail base price	Ala.	Ark.	Calif.	Colo.	Conn.	Del.	D. C.	Fla.	Ga.	Iowa	Ill.
Alaska Refrigerator Co.		A-75	75	\$35.95	\$37.00	\$38.00	\$37.25	\$38.00	\$37.75	\$36.25	\$36.50	\$37.00	\$36.75	\$38.00	\$37.00
American Fixture & Mfg. Co.		A-285	285	63.95	65.00	66.25	65.00	66.25	65.00	65.25	65.25	65.25	65.25	66.25	64.50
Atkins Table & Cabinet Co.		300	75	47.95	49.25	50.75	49.50	50.75	49.25	48.50	48.50	49.25	49.25	50.75	49.25
Brunswick Refrigerator Co.		308	75	44.50	46.00	47.25	46.25	47.25	47.00	45.50	45.50	46.25	46.00	47.25	46.00
Coleman Furniture Co.		VC-75	75	84.50	85.75	88.50	87.25	88.50	88.50	86.25	85.50	86.25	86.00	88.50	86.00
Colson Metal Products Co.		EM-75	75	63.95	65.00	66.25	65.00	66.25	65.00	65.25	65.25	65.25	65.25	66.25	64.50
Cooler Co., The		V-6	75	69.95	71.25	72.75	71.25	72.75	72.75	70.75	70.75	71.25	71.25	72.75	71.25
Dean, Geo. H., Inc.		D-75	75	69.95	71.25	72.75	71.25	72.75	72.75	70.75	70.75	71.25	71.25	72.75	71.25
Dratch's Victory Ref. Box		333	75	46.50	47.50	49.00	48.00	49.00	48.50	47.00	47.00	47.75	47.50	49.00	47.50
Fy-Boro Metal Prod. Co., Inc.		650	75	47.95	49.00	50.50	49.50	50.50	50.00	48.50	48.50	49.25	49.00	50.50	49.00
Ice Cooling Appliance Corp.		Automatic	75	46.50	47.25	48.00	47.25	48.00	47.50	47.25	47.25	47.75	47.50	48.00	47.00
Ice Cooling Appliance Corp.		V-75-D	75	63.95	65.00	66.25	65.00	66.25	65.00	65.25	65.25	65.25	65.25	66.25	64.50
Ice Cooling Appliance Corp.		V-3	50	46.50	47.25	48.00	47.25	48.00	47.50	47.25	47.25	47.75	47.50	48.00	47.00
Ice Cooling Appliance Corp.		V-41	75	63.95	65.00	66.25	65.00	66.25	65.00	65.25	65.25	65.25	65.25	66.25	64.50
Ice Refrigerator Co., Inc.		700	75	42.95	44.25	45.50	44.50	45.50	45.00	43.50	43.50	44.25	44.00	45.50	44.00
King Refrigerator Corp.		A	75	45.95	47.00	48.25	47.25	48.25	47.75	46.25	46.25	47.00	46.75	48.25	46.75
Maine Manufacturing Co.		1557	40	30.50	31.50	32.50	31.50	32.50	32.00	30.50	30.50	31.25	31.00	32.50	31.00
Maine Manufacturing Co.		1558	50	35.50	36.75	38.00	37.00	38.00	37.25	35.75	35.75	36.50	36.25	38.00	36.50
Maine Manufacturing Co.		1559	75	41.95	43.25	44.50	43.50	44.50	44.00	42.50	42.50	43.25	43.00	44.50	43.00
Maine Manufacturing Co.		2057	40	35.50	36.75	38.00	37.00	38.00	37.25	35.75	35.75	36.50	36.25	38.00	36.50
Maine Manufacturing Co.		2058	50	40.50	41.75	43.00	42.00	43.00	42.25	40.75	40.75	41.50	41.25	43.00	41.50
Maine Manufacturing Co.		2059	75	44.95	46.25	47.50	46.50	47.50	47.00	45.50	45.50	46.25	46.00	47.50	46.00
Maine Manufacturing Co.		2258	50	47.50	48.75	50.00	49.00	50.00	49.25	47.75	47.75	48.50	48.25	50.00	48.50
Maine Manufacturing Co.		2259	75	52.50	53.75	55.00	54.00	55.00	54.25	52.75	52.75	53.50	53.25	55.00	53.50
Modern Refrigerator Co. (N. Y.)		100	75	48.95	49.75	50.50	49.50	50.50	50.00	48.50	48.50	49.25	49.00	50.50	49.00
Modern Refrigerator Works (Cal.)		D-30	50	37.50	38.75	40.00	39.00	40.00	39.25	37.75	37.75	38.50	38.25	40.00	38.50
Modern Refrigerator Works		D-50	50	49.95	51.25	52.50	51.50	52.50	52.00	50.50	50.50	51.25	51.00	52.50	51.00
Modern Refrigerator Works		Modern	75	61.50	62.75	64.00	63.00	64.00	63.25	61.75	61.75	62.50	62.25	64.00	62.50
Progress Refrigerator Co.		Progress	75	72.95	74.25	75.50	74.50	75.50	75.00	73.50	73.50	74.25	74.00	75.50	74.00
Progress Refrigerator Co.		Progress	75	84.95	86.25	87.50	86.50	87.50	87.00	85.50	85.50	86.25	86.00	87.50	86.00
Sanitary Refrigerator Co.		Sanitary	75	56.50	57.75	59.00	58.00	59.00	58.25	56.75	56.75	57.50	57.25	59.00	57.50
Sanitary Refrigerator Co.		Sanitary	75	64.95	66.25	67.50	66.50	67.50	67.00	65.50	65.50	66.25	66.00	67.50	66.00
Seeger Refrigerator Co.		V-75	75	69.95	71.25	72.75	71.25	72.75	72.75	70.75	70.75	71.25	71.25	72.75	71.25

Manufacturer	Brand	Model	Rated ice capacity	Retail base price	Ind.	Iowa	Kans.	Ky.	La.	Maine	Md.	Mass.	Mich.	Minn.	Miss.
Alaska Refrigerator Co.		A-75	75	\$35.95	\$36.75	\$37.00	\$37.25	\$36.75	\$37.00	\$36.50	\$36.50	\$36.75	\$36.75	\$37.00	\$37.00
American Fixture & Mfg. Co.		A-285	285	63.95	65.00	66.25	65.00	66.25	65.00	65.25	65.25	65.25	65.25	66.25	64.50
Atkins Table & Cabinet Co.		300	75	47.95	49.25	50.75	49.50	50.75	49.25	48.50	48.50	49.25	49.25	50.75	49.25
Brunswick Refrigerator Co.		308	75	44.50	46.00	47.25	46.25	47.25	47.00	45.50	45.50	46.25	46.00	47.25	46.00
Coleman Furniture Co.		VC-75	75	84.50	85.75	88.50	87.25	88.50	88.50	86.25	85.50	86.25	86.00	88.50	86.00
Colson Metal Products Co.		EM-75	75	63.95	65.00	66.25	65.00	66.25	65.00	65.25	65.25	65.25	65.25	66.25	64.50
Cooler Co., The		V-6	75	69.95	71.25	72.75	71.25	72.75	72.75	70.75	70.75	71.25	71.25	72.75	71.25
Dean, Geo. H., Inc.		D-75	75	69.95	71.25	72.75	71.25	72.75	72.75	70.75	70.75	71.25	71.25	72.75	71.25
Dratch's Victory Ref. Box		333	75	46.50	47.50	49.00	48.00	49.00	48.50	47.00	47.00	47.75	47.50	49.00	47.50
Fy-Boro Metal Prod. Co., Inc.		650	75	47.95	49.00	50.50	49.50	50.50	50.00	48.50	48.50	49.25	49.00	50.50	49.00
Ice Cooling Appliance Corp.		Automatic	75	46.50	47.25	48.00	47.25	48.00	47.50	47.25	47.25	47.75	47.50	48.00	47.00
Ice Cooling Appliance Corp.		V-75-D	75	63.95	65.00	66.25	65.00	66.25	65.00	65.25	65.25	65.25	65.25	66.25	64.50
Ice Cooling Appliance Corp.		V-3	50	46.50	47.25	48.00	47.25	48.00	47.50	47.25	47.25	47.75	47.50	48.00	47.00
Ice Cooling Appliance Corp.		V-41	75	63.95	65.00	66.25	65.00	66.25	65.00	65.25	65.25	65.25	65.25	66.25	64.50
Ice Refrigerator Co., Inc.		700	75	42.95	44.25	45.50	44.50	45.50	45.00	43.50	43.50	44.25	44.00	45.50	44.00
King Refrigerator Corp.		A	75	45.95	47.00	48.25	47.25	48.25	47.75	46.25	46.25	47.00	46.75	48.25	46.75
Maine Manufacturing Co.		1557	40	30.50	31.50	32.50	31.50	32.50	32.00	30.50	30.50	31.25	31.00	32.50	31.00
Maine Manufacturing Co.		1558	50	35.50	36.75	38.00	37.00	38.00	37.25	35.75	35.75	36.50	36.25	38.00	36.50
Maine Manufacturing Co.		1559	75	41.95	43.25	44.50	43.50	44.50	44.00	42.50	42.50	43.25	43.00	44.50	43.00
Maine Manufacturing Co.		2057	40	35.50	36.75	38.00	37.00	38.00	37.25	35.75	35.75	36.50	36.25	38.00	36.50
Maine Manufacturing Co.		2058	50	40.50	41.75	43.00	42.00	43.00	42.25	40.75	40.75	41.50	41.25	43.00	41.50
Maine Manufacturing Co.		2059	75	44.95	46.25	47.50	46.50	47.50	47.00	45.50	45.50	46.25	46.00	47.50	46.00
Maine Manufacturing Co.		2258	50	47.50	48.75	50.00	49.00	50.00	49.25	47.75	47.75	48.50	48.25	50.00	48.50
Maine Manufacturing Co.		2259	75	52.50	53.75	55.00	54.00	55.00	54.25	52.75	52.75	53.50	53.25	55.00	53.50
Modern Refrigerator Co. (N. Y.)		100	75	48.95	49.75	50.50	49.50	50.50	50.00	48.50	48.50	49.25	49.00	50.50	49.00
Modern Refrigerator Works (Cal.)		D-30	50	37.50	38.75	40.00	39.00	40.00	39.25	37.75	37.75	38.50	38.25	40.00	38.50
Modern Refrigerator Works		D-50	50	49.95	51.25	52.50	51.50	52.50	52.00	50.50	50.50	51.25	51.00	52.50	51.00
Modern Refrigerator Works		Modern	75	61.50	62.75	64.00	63.00	64.00	63.25	61.75	61.75	62.50	62.25	64.00	62.50
Progress Refrigerator Co.		Progress	75	72.95	74.25	75.50	74.50	75.50	75.00	73.50	73.50	74.25	74.00	75.50	74.00
Progress Refrigerator Co.		Progress	75	84.95	86.25	87.50	86.50	87.50	87.00	85.50	85.50	86.25	86.00	87.50	86.00
Sanitary Refrigerator Co.		Sanitary	75	56.50	57.75	59.00	58.00	59.00	58.25	56.75	56.75	57.50	57.25	59.00	57.50
Sanitary Refrigerator Co.		Sanitary	75	64.95	66.25	67.50	66.50	67.50	67.00	65.50	65.50	66.25	66.00	67.50	66.00
Seeger Refrigerator Co.		V-75	75	69.95	71.25	72.75	71.25	72.75	72.75	70.75	70.75	71.25	71.25	72.75	71.25

Sec. 16 Table C—Continued.

Manufacturer	Brand	Model	Rated ice capacity	Retail base price	Ind.	Iowa	Kans.	Ky.	La.	Maine	Md.	Mass.	Mich.	Minn.	Miss.
MAIL ORDER AND OTHER PRIVATE BRANDS SOLD THROUGH RETAIL STORES			Lbs.												
Montgomery Ward	Ward	K-438	50	\$40.25	\$40.75	\$40.75	\$41.25	\$41.00	\$41.75	\$41.75	\$41.50	\$41.50	\$50.00	\$41.00	\$41.50
Montgomery Ward	Ward	K-430	75	55.75	56.25	56.25	56.50	56.50	57.00	57.00	56.75	56.75	56.25	56.50	56.75
Sears Roebuck	Sears	2058	50	37.25	38.25	38.50	39.00	38.50	39.00	37.75	38.00	37.50	38.25	38.75	38.75
Sears Roebuck	Sears	2059	75	41.25	42.50	42.75	43.25	42.50	43.25	41.75	42.00	41.50	42.50	43.00	43.00
Sears Roebuck	Sears	2226	50	43.75	44.75	45.25	45.50	45.00	45.75	44.25	44.50	44.00	44.75	45.25	45.25
Sears Roebuck	Sears	2256	75	47.95	49.25	49.50	50.00	49.25	50.00	48.50	48.75	48.25	49.25	49.75	49.75
Sears Roebuck	Sears	7500	75	64.50	66.00	65.25	66.25	66.00	67.00	66.75	66.50	66.50	65.50	65.25	66.50
Western Auto Supply Co.	Royal Iceette	D-30	50	34.95	36.25	36.25	36.25	36.25	36.25	36.50	36.50	36.50	36.25	36.25	36.25
Western Auto Supply Co.	Royal Iceette	D-50	50	47.50	50.00	50.00	49.75	50.00	49.75	50.25	50.25	50.25	50.00	50.00	50.00

Dollars-and-Cents Prices on Iceboxes (Cont.)

Sec. 16 Table C—Continued.

Manufacturer	Brand	Model	Rated ice capacity	Retail base price	Pa.	R. I.	S. C.	S. Dak.	Tenn.	Tex.	Utah	Vt.	Va.	Wash.	W. Va.	Wis.	Wyo.
Alaska Refrigerator Co.		A-75	75	\$35.95	\$36.50	\$36.50	\$36.50	\$37.50	\$37.50	\$37.50	\$38.00	\$38.00	\$38.00	\$38.50	\$38.50	\$38.50	\$37.75
American Fixture & Mfg. Co.		A-285	75	63.95	65.00	65.25	65.25	65.25	65.25	65.25	65.25	65.25	65.25	65.25	65.25	65.25	65.25
Atkins Table & Cabinet Co.		300	75	47.95	48.50	48.50	49.00	50.00	50.00	50.00	50.75	48.50	48.75	50.75	48.75	49.25	50.25
Brunswick Ref. Co.		308	75	44.95	45.50	45.50	45.75	46.75	46.75	47.25	45.50	45.50	47.25	45.50	46.00	47.00	47.00
Coleman Furniture Co.		VC-75	75	84.50	85.75	86.25	85.75	88.00	85.75	88.25	88.50	86.25	88.25	88.50	88.50	88.50	88.50
Colson Metal Products Co.		EM-75	75	63.95	65.00	65.25	65.25	65.00	64.75	65.00	65.25	65.25	65.00	65.00	65.00	64.50	65.00
Cooler Corp., The		V-6	75	69.95	71.75	72.00	72.50	71.50	71.75	72.50	72.75	72.00	72.00	72.75	71.75	70.75	72.25
Dean, Geo. H., Inc.	Dean	D-75	75	69.95	71.00	70.25	71.25	72.50	71.50	72.50	73.25	70.75	71.00	73.25	71.00	71.50	72.75
Dratch's Victory Ref. Box		333	75	46.50	47.00	47.00	47.50	48.25	47.50	48.25	49.00	47.00	47.00	49.00	47.25	47.50	48.50
Fy-Boro Metal Prod. Co., Inc.		650	75	47.95	48.50	48.50	48.75	49.75	49.75	49.75	49.75	49.75	49.75	49.75	49.75	49.75	49.75
Ice Cooling Appliance Corp.	Sta-Kold	V-50	75	63.95	65.00	65.25	65.25	65.00	64.75	65.00	65.25	65.25	65.00	65.00	65.00	64.50	65.00
Ice Cooling Appliance Corp.	Automatic	V-75-D	75	63.95	65.00	65.25	65.25	65.00	64.75	65.00	65.25	65.25	65.00	65.00	65.00	64.50	65.00
Ice Cooling Appliance Corp.	Vitalaire	V-3	75	46.50	47.25	47.50	47.50	47.25	47.00	47.50	48.00	47.50	47.25	48.00	47.25	47.50	47.50
Ice Cooling Appliance Corp.	Vitalaire	V-41	75	63.95	65.00	65.25	65.25	65.00	64.75	65.00	65.25	65.25	65.00	65.00	65.00	64.50	65.00
Iceland Ref. Co., Inc.		700	75	48.95	49.50	49.50	49.75	50.50	50.00	50.75	51.25	49.50	49.50	51.25	49.50	50.00	51.00
King Refrigerator Corp.		A	75	49.50	50.00	50.00	50.25	51.00	50.50	51.25	51.75	50.00	50.00	51.75	50.00	50.50	51.50
Maine Manufacturing Co.	White Mountain	1557	40	30.50	31.00	31.00	31.25	32.00	31.50	32.25	32.50	31.00	31.00	32.50	31.25	31.50	32.25
Maine Manufacturing Co.	White Mountain	1558	50	35.50	36.25	36.00	36.50	37.25	36.75	37.50	38.00	36.00	36.25	38.00	36.25	36.50	37.25
Maine Manufacturing Co.	White Mountain	1559	75	41.95	42.75	42.50	43.00	44.00	43.25	44.25	44.75	42.50	42.75	44.75	43.00	43.25	44.50
Maine Manufacturing Co.	White Mountain	2057	40	35.50	36.25	36.00	36.50	37.00	36.50	37.25	37.75	36.00	36.25	37.75	36.25	36.50	37.50
Maine Manufacturing Co.	White Mountain	2058	50	40.50	41.25	41.00	41.50	42.50	41.75	42.50	43.00	41.00	41.25	43.00	41.50	41.75	42.75
Maine Manufacturing Co.	White Mountain	2059	75	44.95	45.75	45.50	46.25	47.00	46.50	47.25	47.75	45.50	45.75	47.75	46.00	46.25	47.50
Maine Manufacturing Co.	White Mountain	2258	50	47.50	48.25	48.00	48.50	49.50	48.75	49.50	50.25	48.50	48.75	50.25	48.50	48.75	49.75
Maine Manufacturing Co.	White Mountain	2259	75	52.50	53.25	53.00	53.75	54.75	54.00	54.75	55.50	53.50	53.75	55.50	53.75	54.00	55.00
Modern Ref. Co. (N. Y.)	Modern	D-50	50	49.95	50.75	50.50	51.00	52.00	51.25	52.00	52.50	50.50	50.75	52.50	50.75	51.00	52.00
Modern Ref. Works (Cal.)	Modern	D-30	50	37.50	38.00	38.00	38.25	39.00	38.75	39.00	39.25	38.00	38.25	39.25	38.00	38.25	39.00
Modern Ref. Works	Modern	D-50	50	49.95	50.75	50.50	51.00	52.00	51.25	52.00	52.50	50.50	50.75	52.50	50.75	51.00	52.00
Modern Ref. Works	Modern	M-75	75	61.50	62.25	62.00	62.50	63.50	62.75	63.50	64.00	62.50	62.75	64.00	62.50	62.75	63.50
Progress Ref. Co.	Progress	75	59	72.95	74.00	74.25	74.75	75.75	75.00	75.75	76.00	74.25	74.50	76.00	74.50	74.75	75.25
Progress Ref. Co.	Progress	75	75	84.95	86.25	86.75	86.50	87.25	86.00	87.00	87.50	86.75	86.50	87.50	86.25	86.50	87.00
Sanitary Ref. Co.	Sanitary	MV-2125	75	56.50	57.75	58.00	58.25	59.00	58.25	59.00	59.25	58.00	58.25	59.25	58.00	58.25	59.00
Sanitary Ref. Co.	Sanitary	MV-2126	75	64.95	66.25	66.50	66.75	67.50	66.75	67.50	67.75	66.50	66.75	67.75	66.50	66.75	67.50
Seeger Ref. Co.		V-75	75	69.95	71.75	72.00	72.25	73.25	72.50	73.25	73.75	72.00	72.25	73.75	72.00	72.25	73.00

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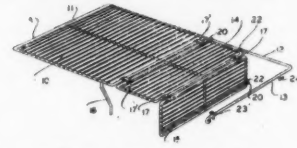
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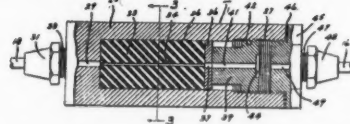
cuit, a parallel circuit portion around said chronometer operated switch including in series a contact closed by the armature of the relay, a switch normally closed but opened by said chronometer device at a predetermined time after the closing and opening of the first-named chronometer operated switch, and a thermostatic switch responsive to the temperature of said surface to be defrosted and adapted to be opened when the temperature of said surface rises above the freezing point, and means for delaying the operation of said relay until a substantial time has elapsed after the opening of the refrigerator door.

2,319,470. REFRIGERATOR SHELF.
Warren H. Nobles, St. Paul, Minn., assignor to Seeger Refrigerator Co., St. Paul, Minn., a corporation of Minnesota. Application July 19, 1941, Serial No. 403,169. 5 Claims. (Cl. 211-153.)



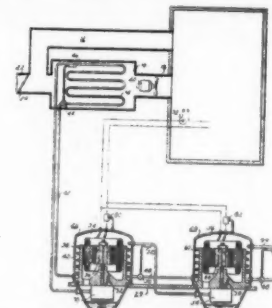
3. A sectional wire shelf for refrigerators including a series of shelf portions hinged and slidably connected together, lugs secured rigidly to said shelf portions, a frame for supporting said shelf portions in a refrigerator compartment, said lugs adapted to engage said frame to support said shelf portions in a horizontal single plane, means for connecting said frame to shelf supporting buttons on the walls of the refrigerator compartment to rigidly support said frame therein, said lugs providing a means whereby said sectional shelf portions may be folded either up or down to provide a shelfless portion in the refrigerator adjacent the remaining shelf portion, the portions of said shelf which are folded out of the normal plane of said shelf acting as an end guard either under the remaining shelf portion or projecting up from the same, to provide a wire shelf basket compartment.

2,319,498. REFRIGERATOR APPARATUS.
Frank W. Gerard, Dayton, Ohio, assignor to General Motors Corp., Dayton, Ohio, a corporation of Delaware. Application Nov. 20, 1940, Serial No. 366,442. 8 Claims. (Cl. 62-8.)



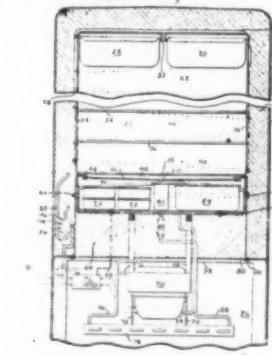
1. A refrigerating apparatus comprising, a cabinet having a compartment therein to be cooled, a closed refrigerant circuit associated with said cabinet, said circuit including an evaporator for cooling said compartment, a refrigerant compressing and liquefying unit and a restrictor element exposed to temperatures exteriorly of said compartment, means within said restrictor element and forming a continuously open capillary passage through of great length in proportion to its cross-sectional area for controlling the flow of liquid refrigerant from said unit to said evaporator, said passage forming means being expandable and contractible in response to changes in temperature exteriorly of said compartment, and said means being so constructed and arranged that expansion and contraction thereof varies the cross-sectional area of said capillary passage.

2,319,502. REFRIGERATING APPARATUS AND METHOD.
Richard E. Gould, Oakwood, Ohio, assignor to General Motors Corp., Dayton, Ohio, a corporation of Delaware. Application March 24, 1941, Serial No. 384,816. 5 Claims. (Cl. 62-115.)



4. Air conditioning apparatus for an enclosure comprising in combination, a primary evaporator in thermal exchange with air for said enclosure, primary refrigerant liquefying mechanism for supplying primary liquid refrigerant to said primary evaporator, secondary refrigerant liquefying mechanism for cooling said primary refrigerant liquefying apparatus, means responsive to the condition of air within said enclosure simultaneously controlling the operation of said primary refrigerant liquefying mechanism and said secondary refrigerant liquefying mechanism, and means responsive to the refrigerant pressure in one of said mechanisms for controlling the operation of one of said mechanisms.

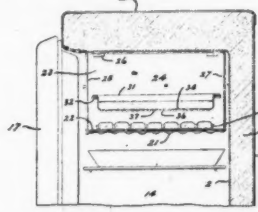
2,319,532. REFRIGERATING APPARATUS.
Edmund F. Schweller, Dayton, Ohio, assignor to General Motors Corp., Dayton, Ohio, a corporation of Delaware. Application May 25, 1940, Serial No. 337,292. 12 Claims. (Cl. 62-103.)



1. The method which comprises removing heat from a storage compartment at

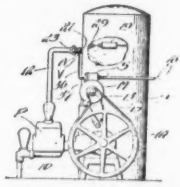
temperatures above 32° F. and condensing moisture from the air in the compartment, transferring in liquid form the condensed moisture to a place of collection, freezing the condensed moisture at the place of collection, removing in frozen condition the frozen condensed moisture from the place of collection and disposing of the frozen condensed moisture.

2,319,523. REFRIGERATING APPARATUS.
Chester S. Trigg, Dayton, Ohio, assignor to General Motors Corp., Dayton, Ohio, a corporation of Delaware. Application July 21, 1941, Serial No. 403,327. 9 Claims. (Cl. 62-172.)



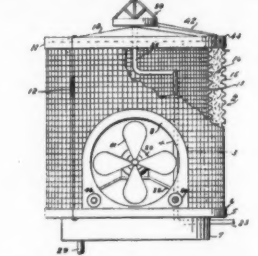
8. The method of producing blocks of ice in a compartment which comprises, dripping water from a source thereof at spaced apart points within the compartment upon a horizontally disposed surface and freezing the water to cause same to build up on the surface in the form of a plurality of ice blocks.

2,319,554. UNIVERSAL AIR VOLUME CONTROLLING DEVICE.
Albert Penn, Elkhart, Ind., and Burton E. Shaw, Bristol, Ind., assignors to Penn Electric Switch Co., Goshen, Ind., a corporation of Iowa. Application Nov. 25, 1940, Serial No. 367,106. 19 Claims. (Cl. 103-6.)



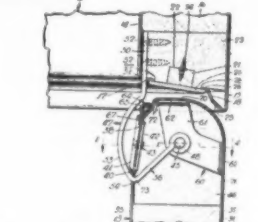
1. In a universal air volume controlling device, a tank, a water supply line thereto, a fitting interposed in said water supply line, a pair of passageways through said fitting, one of said passageways being large enough to permit substantially the entire output of water from said pump to be pumped through said passageway, the other of said passageways being restricted and of Venturi shape and having a removable Venturi intake nozzle, an air valve communicating with said Venturi passageway, a butterfly valve for controlling the flow of water through said first passageway, and a float for operating said butterfly valve to permit water flow through said first passageway when said butterfly valve is open in response to a low level of water in said tank and prevent such flow in response to a high level of water in said tank, whereupon the flow of water through said Venturi passageway effects introduction of air through said air valve and into said tank.

2,319,565. EVAPORATIVE COOLER.
Robert S. Stratton, Phoenix, Ariz. Application Aug. 1, 1942, Serial No. 453,171. 2 Claims. (Cl. 261-97.)



1. An evaporative air cooler having a body consisting of an evaporative pad positioned around its perimeter, a bottom portion forming a closure, and having a sump, a top lid forming a closure for the top thereof, and having an annular trough around its perimeter, the bottom thereof being perforated with a plurality of equally spaced holes positioned above the top rim of said pad, a circulating fan positioned within said body portion and adapted to direct air outward through a vent, a vent opening formed in the side of said pad, a water supply pipe adapted to deliver water under pressure to a turret nozzle positioned above said top, a water distributing turret including an annular turbine chamber, positioned above an annular trough provided with a supporting bearing above said discharge nozzle and adapted to turn in a horizontal plane and carrying a water distributing sweep pipe, said pipe extending radially therefrom to the annular trough formed around the outer rim of said top, a means for regulating the flow of water through said supply pipe.

2,319,600. REFRIGERATOR STRUCTURE.
Dudley E. Heath, New York, N.Y., assignor to Servel, Inc., New York, N.Y., a corporation of Delaware. Application May 16, 1940, Serial No. 335,451. 3 Claims. (Cl. 20-16.)



1. In a door mounting, a refrigerator door of a type having spaced apart wall members and extending substantially to the exterior lateral side walls of a body of a refrigerator so as to overlie the front thereof when the door is in its closed position, the inner wall member having an opening, a hinge comprising a stationary strap extending through the opening in said inner wall member and having one end thereof attached to the body of the refrigerator at a region adjacent to one of the exterior lateral side walls, a supporting frame carried

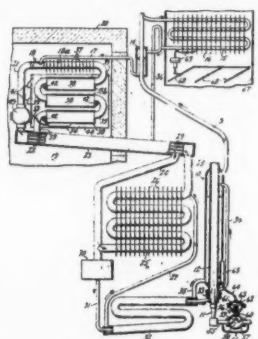
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Patents (Cont.)

(Concluded from Page 26, Column 5)

by said door in the space between said wall members, said supporting frame being pivotally mounted upon said strap at a region of the latter in front of and spaced from the body of the refrigerator, the region of said strap at which said supporting frame is pivotally mounted thereon constituting the axis about which said door rotates with respect to the body of the refrigerator, said stationary strap having a curved intermediate part concentric about the axis of rotation of said door, a sealing strip cooperating between the inner side of said door and the body of the refrigerator to form a seal when said door is in its closed position, said sealing strip being so disposed that, when the refrigerator is viewed from the front and said door is in its closed position, the portion of said sealing strip in the vicinity of said hinge lies between said one exterior lateral side wall of the refrigerator and the opening in said inner wall member, the portion of said door between said one exterior lateral side wall and the axis about which said door rotates being freely movable through approximately a right angle toward the front of the refrigerator body when said door is moved from closed to open position, the part of said stationary strap projecting from and in front of the body of the refrigerator determining the extent of movement of said door when moved from closed to open position, and the distance of said axis of rotation from said spaced apart wall members and the peripheral edge portion of said door at said one exterior lateral side wall being such that, when said door is rotated through approximately a right angle from closed to open position, the overall width of the space taken up by the body of the refrigerator and said door is substantially no greater than the distance between the exterior lateral side walls of the refrigerator body.

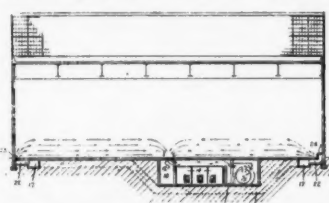
2,319,601. REFRIGERATION. William T. Hedlund, New Rochelle, N. Y., assignor to Servel, Inc., New York, N. Y., a corporation of Delaware. Application Oct. 1, 1938, Serial No. 232,697. 14 Claims. (Cl. 62-5).



3. In a refrigeration system of the absorption type, an evaporator adapted to hold a relatively large quantity of liquid refrigerant, an absorber, conduits connecting said evaporator and said absorber for circulation of inert gas, a closure in one of said conduit, and auto-

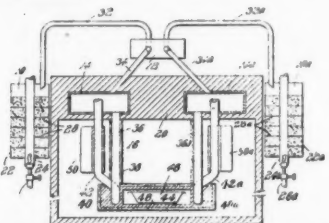
matic means to control said closure in response to evaporator temperature.

2,319,703. METHOD OF HEATING AND VENTILATING. Arthur A. Olson, Youngstown, Ohio. Application Dec. 17, 1938, Serial No. 246,343. 4 Claims. (Cl. 92-33).



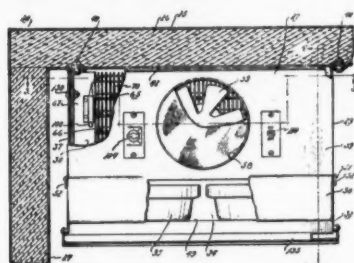
1. A heating and ventilating system for a relatively large enclosure comprising a tunnel extending substantially centrally beneath the floor of the enclosure, a series of grills between said tunnel and enclosure, an air heating furnace, ducts positioned beneath said floor and extending outwardly to positions adjacent the outer wall of said enclosure, means in said floor providing communication between the enclosure and said ducts, and air circulating means adapted to withdraw return air from said tunnel and propel the same through said furnace and ducts.

2,319,806. ABSORPTION OR ADSORPTION REFRIGERATING APPARATUS. Nils Erland af Klen, Stockholm, Sweden. Application Sept. 5, 1939, Serial No. 293,477. In Germany April 19, 1939. 20 Claims. (Cl. 62-115).



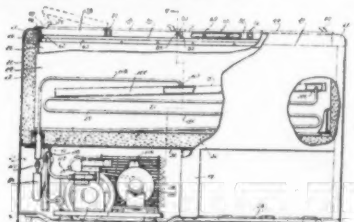
11. Refrigerating apparatus of the intermittent absorption type having at least two units operating in out of phase relationship, each unit including an evaporator formed with at least two cold producing sections, and heat conducting means connecting one of said cold producing sections of one evaporator to the corresponding cold producing section of the other evaporator, whereby substantially continuous low temperature is maintained by said connected cold producing sections through said means, the other cold producing sections of the evaporators being separated from one another, whereby each of said separated sections is intermittently cooled with frost and alternately defrosted during the operation of the corresponding unit.

2,319,878. REFRIGERATING APPARATUS. Lawrence A. Philipp, Detroit, Mich., assignor to Nash-Kelvinator Corp., Detroit, Mich., a corporation of Maryland. Application Nov. 16, 1940, Serial No. 365,965. 2 Claims. (Cl. 62-102).



1. Refrigerating apparatus comprising in combination a cabinet having a food storage compartment, an enclosure member secured within said compartment in spatial relation to front and rear well thereof enclosing an air cooling zone and a low temperature zone heat absorbing means including a portion positioned in said low temperature zone for maintaining low temperatures in said low temperature zone, and a portion in said air cooling zone for cooling the circulating air as it passes through said air cooling zone, means interconnecting said portions to control the flow of refrigerant therethrough to maintain a relatively low temperature in the first mentioned portion for freezing substances and a relatively high temperature in the second mentioned portion for cooling circulating air, and a fan for directing the flow of air from adjacent the front wall of said compartment through said air cooling zone and along the rear wall of said food storage compartment.

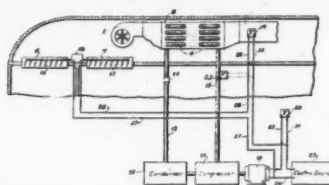
2,319,890. REFRIGERATING APPARATUS. Richard H. Swart, Detroit, Mich., assignor to Nash-Kelvinator Corp., Detroit, Mich., a corporation of Maryland. Application Nov. 25, 1940, Serial No. 366,941. 3 Claims. (Cl. 62-99).



1. Refrigerating apparatus comprising a box-like liner, a serpentine refrigerant evaporating conduit in heat exchange relation with said liner, and a second and larger refrigerant evaporating conduit connected in series to the outlet of said first conduit and secured in a substantially straight line tilted position in heat exchange relation to said liner above the outlet end of said first conduit, said second conduit having its inlet and outlet located in the higher portion thereof.

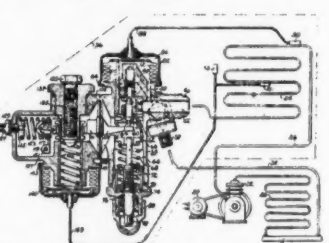
2,319,905. AIR CONDITIONING SYSTEM UTILIZING REFRIGERATION. Robert T. Palmer, Sharon, Mass., assignor to E. F. Sturtevant Co., Boston, Mass. Application Sept. 3, 1939, Serial No. 293,939. 1 Claim. (Cl. 62-6).

An air cooling system comprising refrigerant evaporator tubes arranged as air cooling tubes, means for supplying



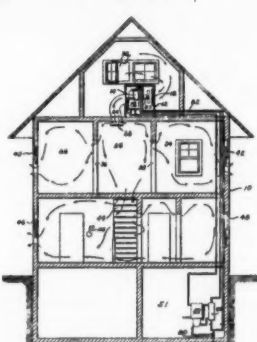
outdoor air and air recirculated from the space served, to said tubes for cooling, refrigerating means including a compressor for supplying refrigerant to said tubes, means including a thermostat in the space served for controlling said compressor, means forming an outlet for the air from said tubes, into said space, and means including a second thermostat exposed to the air from said tubes and said outlet, for adjusting said first mentioned means to increase the proportion of outdoor air when the temperature of the air from said tubes is below a predetermined point and for increasing the proportion of recirculated air when the temperature of the air leaving said tubes is above said point.

2,319,993. REFRIGERATING APPARATUS. Daniel L. Kaufman, Dayton, Ohio, assignor to General Motors Corp., Dayton, Ohio, a corporation of Delaware. Application Oct. 28, 1940, Serial No. 363,072. 5 Claims. (Cl. 62-8).



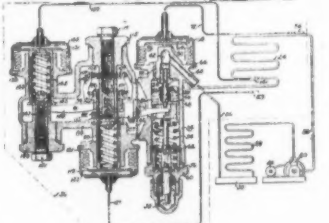
1. Refrigerating apparatus including a medium to be cooled, an evaporating means for cooling the medium, an expansion valve for controlling the flow of refrigerant into the evaporating means, said expansion valve including thermostatic and pressure normal control means effectively responsive to the pressure of the refrigerant in the evaporating means and to the temperature at the outlet of the evaporating means for normally controlling the valve opening, said expansion valve including an independent additional snap action independent of said normal control means, said additional control including a second thermostatic means responsive to the temperature of the medium and a third thermostatic means responsive to the temperature of the evaporating means.

2,320,035. REFRIGERATING APPARATUS. Richard E. Gould, Oakwood, Ohio, assignor to General Motors Corp., Dayton, Ohio, a corporation of Delaware. Application Oct. 29, 1940, Serial No. 363,518. 7 Claims. (Cl. 62-129).



1. Air conditioning apparatus comprising in combination, an evaporator, refrigerant liquefying means including a condenser for supplying liquid refrigerant to said evaporator, an air cooling coil, means for flowing a stream of liquid in thermal exchange with said evaporator and thereafter through said air cooling coil, means for flowing liquid leaving said air cooling coil in thermal exchange with said condenser, a second air cooling coil, and means for flowing a second stream of liquid directly into said second air cooling coil and thereafter in thermal exchange with said condenser.

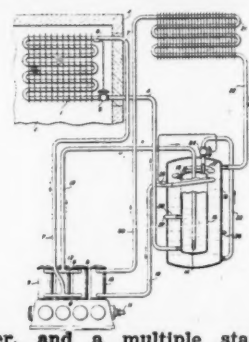
2,320,055. REFRIGERATING APPARATUS. Carl A. Stichel, Dayton, Ohio, assignor to General Motors Corp., Dayton, Ohio, a corporation of Delaware. Application Oct. 29, 1940, Serial No. 363,088. 5 Claims. (Cl. 62-8).



2. Refrigerating apparatus including refrigerant liquefying and evaporating means, an expansion valve for controlling the flow of refrigerant from the liquefying means to the evaporating means, a medium to be cooled, said evaporating means being located in heat exchange relationship with said medium, said expansion valve including normal control means responsive to the refrigerant in the evaporating means for normally controlling the operation of the valve, an additional independent closing means independent of the normal control of the valve responsive to the temperature of said medium for overcoming the normal control of the valve to close the valve, and means responsive to the temperature of a portion of said evaporating means for releasing said closing means.

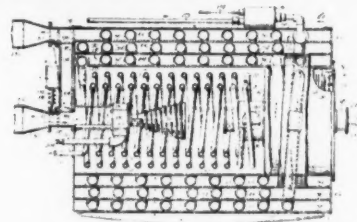
2,320,097. REFRIGERATION. Clyde E. Ploeger, Evansville, Ind., assignor to Servel, Inc., New York, N. Y., a corporation of Delaware. Application Aug. 20, 1941, Serial No. 407,519. 8 Claims. (Cl. 62-115).

2. In a refrigerating apparatus comprising a low-temperature evaporator, a



condenser, and a multiple stage compressor, the combination of a liquid receiver receiving refrigerant liquid from said condenser, and a high-temperature evaporator disposed within said receiver and receiving refrigerant liquid therefrom and supplying liquid refrigerant to said low-temperature evaporator, said high-temperature evaporator being connected to the outlet of a low pressure stage of said compressor apparatus and receiving gas discharged therefrom, and being connected also to the inlet of a high pressure stage of said compressor apparatus and supplying gas thereto.

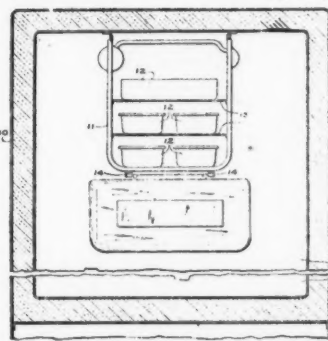
2,320,265. REFRIGERATING APPARATUS. Leonard P. Clero, Chicago, Ill. Application Jan. 22, 1940, Serial No. 314,905. 8 Claims. (Cl. 62-115).



1. In a refrigerating system, the combination of a chamber having a space

to be cooled, a heat exchanger having generally parallel passageways there-through for the circulation of air and refrigerant in heat exchange relationship, means to supply a refrigerating medium to said heat exchanger, a blower for circulating air serially through said heat exchanger and said chamber, automatically operable means for limiting the circulation of air by said blower to flow through said heat exchanger during a fixed interval in a refrigerating cycle of predetermined length, and means to heat said heat exchanger while the air is limited to flow therethrough.

2,326. REFRIGERATION APPARATUS. Theodore W. Rundell, Abington, Pa., assignor to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., a corporation of Pennsylvania. Original No. 2,202,903, dated May 28, 1940, Serial No. 205,330, April 30, 1938. Application for re-issue Aug. 30, 1941, Serial No. 407,630. 8 Claims. (Cl. 62-89).



1. In a mechanical refrigerator, the combination of a refrigerator cabinet, a cooling unit therein, a food storage vessel disposed below said cooling unit, a cover member for said food storage vessel, and means secured to said cooling unit for slidably suspending and normally retaining the cover member in a fixed position relative to said cooling unit ducting path therebetween.

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Humi-Temp Forced Convection Units—Patented CROSS-FIN COILS—Bare Tube Coils—Zinc Fused Steel Plate

Coils—Disseminator Pans—Heat Exchangers—Evaporative Condensers—Instantaneous Water Coolers—

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RATES for all other classifications, 10¢ per word, minimum charge, \$5.00 per insertion. Three consecutive insertions, 2¢ per word, minimum charge, \$12.50.

ADVERTISEMENTS set in usual classified style. Box addresses count as five words, other addresses by actual word count.

EQUIPMENT FOR SALE

STORAGE REFRIGERATORS, 30 cu. ft. Porcelain inside and out. Blower coils. General Electric Condensing Units, 110-1-60; also Brunner Condensing Units, 1/4-1/2 HP., 110/220-1-60, Freon and Methol. All equipment new, original crates. Immediate delivery. Dealers can purchase without prior. **RAMSEY BROTHERS CO., 727 Bolivar Road, Cleveland, Ohio.**

SPECIAL CLEARANCE closing out: Commercial and domestic coils, ice cube trays, step-up transformers, rubber gasket. Fraction original cost. Box 1444, Air Conditioning & Refrigeration News.

CARBON TETRACHLORIDE, \$1.40 per gallon in 5 gallon lots; limited quantity, 50¢ deposit for container; 1/2 to 1/2 h.p. 2-cylinder Frigidaire compressor, \$7.00 4-tray evaporators, wound with 3/8" copper lined tubing, expansion type, like new with porcelain fronts, less trays, \$8.50. 2-tray Frigidaire used, evaporators, with float, complete less trays and brackets, \$8.50. 2-tray, same as above, \$10.00. Used Frigidaire complete high sides, Model "K" with bare copper tubing condenser, low pressure switch and frame enclosure, 1/2 h.p. capacity, complete less motor, \$15.00. Send for bargain catalogue. F. O. B. **EDISON COOLING CORP., 310 E. 149th St., New York City.**

POSITIONS AVAILABLE

ENGINEER, DEVELOPMENT. Long established Detroit manufacturer now on defense work has several openings for development engineers with experience on one or more types of electrical-mechanical home equipment. Good chance for right men to initiate original designs and carry them through to production. This work is on products for post-war use and offers an excellent opportunity for the future. In replying furnish complete personal data, draft status and past employment record. All applications will be treated in confidence. Box 1441, Air Conditioning & Refrigeration News.

Local Boards Held Key To Deferment Of Servicemen

(Concluded from Page 1, Column 4) three months.

Prepare a list of the men taken by the government.

Prepare a list of the men lost to defense industries.

List the number of units which have to be maintained.

Determine how many commercial units the average man can service.

Determine how many domestic units the average man can service.

Try to Reach Nelson

With the fact that those in authority should be advised of the coming problems in mind, Mr. Wyllie made an effort to reach Donald Nelson, but was referred by his office to Mr. Davis, deputy for Mr. Nelson. Mr. Davis was also unobtainable. Mr. Wyllie was then referred to Mr. Hobart, with whom he talked at some length.

Mr. Hobart arranged for a meeting of the Council with R. W. Charles, assistant director of the General Industrial Equipment Branch, F. W. Smith, chief of the Special Equipment Branch, Sterling Smith, F. L. Lucker, assistant director, and A. I. Topping, chief of the Resource Branch attended the meeting.

It was decided that WPB can help the Council only as far as replacement parts and material are concerned. These gentlemen, however, agreed that the principal trouble was going to be lack of servicemen. Mr. Topping therefore undertook to arrange a meeting with Selective Service Headquarters and with General Hershey if possible.

Up to Local Boards

On May 21, the general's assistant, Lieut. Col. Paul H. Griffith, and Capt. B. H. Golder spent some time with the Council, during which the Council presented its case. But as refrigeration servicemen are already listed under Part 3 of Occupational Bulletin No. 31, it was made apparent that the only thing possible was to convince the local draft boards of the need for these men, and if necessary, draw it to the attention of the state director.

However, had there been any possibility of assistance from this department, the Council would not have been able to take advantage of it because it lacked the following information, according to Selective Service headquarters:

Information Needed

1. Number of men now on the maintenance of refrigeration.
2. How many of these are within the draft ages.
3. The classification of those of draft age.
4. The classification or number of men required for minimum service requirements.

There was a brief discussion concerning the advisability of informing the public of the trouble ahead and of the Council's attempts to avoid it. The majority present at the meeting were in favor of some sort of publicity.

Those present at the meeting of the Refrigeration War Council included John Wyllie, Jr., (chairman), Temprite Products Corp., representing Refrigeration Equipment Manufacturers Assn.; R. H. Luscombe, Penn Electric Switch Co., alternate for Refrigeration Equipment Manufacturers Assn.; C. R. Logan, Superior Valve & Fittings Co., representing American Society of Refrigerating Engineers; W. H. Aubrey, Frick Co., representing Air Conditioning & Refrigerating Machinery Assn.

E. A. Terhune, Servel, Inc., representing Standard Refrigeration Compressor Assn.; B. J. Scholl, Brunner Mfg. Co., alternate for Standard Refrigeration Compressor Assn.; E. A. Plesskott, representing Refrigeration Service Engineers Society; C. E. Harris, alternate for Refrigeration Service Engineers Society; Harry Alter, the Harry Alter Co., representing National Refrigeration Supply Jobbers Assn.; Alex Aolcombe, Jr., alternate for National Refrigeration Supply Jobbers Assn.; and J. W. Hart, McCray Refrigerator Co., representing Commercial Refrigerator Manufacturers Assn.

Brouse Rinehart Buys Rights To the 'Mayflower' Condensing Unit

(Concluded from Page 1, Column 3)

Mr. Rinehart is a native of Richmond. After attending Purdue university, where he studied electrical engineering, Mr. Rinehart went into the radio repair business in 1930. He later branched out into appliance and refrigeration distribution and repair, and then established Rinehart, Inc., as a refrigerator and radio parts wholesaling concern.

The "Mayflower" is the descendant of one of the oldest lines of low pressure condensing units that have had a more or less continuous history. The unit was originally designed in 1920 by Fred Geller, well

known in the oldtime engineering circles, for use in the "Valley" refrigerator. In 1927 the Master Motor Co. of Dayton took over and produced the "Everite" refrigerator.

In 1929 the company name was changed to the Trupar Mfg. Co. and in 1929 the trade-name "Mayflower" was given to the products.

In 1934 the company ran into management problems and it was necessary to sell the business. The commercial refrigeration part of the business was sold to Homer Hardy of Dayton. It is this business which has just been purchased by Mr. Rinehart.

'Quantity Discounts' On Stoves Cut Out Due To Rationing

WASHINGTON, D. C.—A statement of explanation on "eliminating quantity discounts by voluntary rationing" on domestic cooking and heating stoves, under price schedule No. 64, is given by the Office of Price Administration to the effect that only quantity discounts figured on actual quantity sold can be allowed.

Included in "Violations and Evasions" (of price schedule No. 64) OPA's interpretation reads: "Where a manufacturer institutes bona fide voluntary rationing of stoves to his customers, because his production has

been substantially cut and production cannot be expanded to meet increased demand, he is required to give only the quantity discounts applicable to the actual quantity sold on each order, regardless of the quantity ordered."

Florida Stations Added For Servel Radio Show

NEW YORK CITY—Servel, Inc. has announced it will add the six stations comprising CBS' Florida Group to its "Fashions in Rations" station lineup, effective July 3. With the addition of the Florida group, the program will be heard over a total of 74 Columbia outlets.

"Fashions in Rations" is Servel's second campaign over CBS.



BIG DIVIDENDS . . .



What's going to happen after the war? Not what's going to happen to the world. That will be decided by generals, parliaments and politicians. But what's going to happen to YOU?

What happens to you will depend pretty much on what you do NOW! And here's why...

The ranks of refrigeration dealers are being depleted... by war industry, by the armed forces, and by death. When the war is over there will be less than half the number of dealers there were when it began.

At the same time, the refrigeration business is increasing. New uses have opened new markets. Suddenly expanded supply will bring out long pent-up demand. By conservative estimate, there will be twice as much business after the war as there was when it began.

Half as many dealers and twice as much

business means FOUR TIMES as much business per dealer.

But... you can't jump into this business over-night... you can't be an in-and-outer and cash in. The dealers who cash in will be the dealers who stay in.

We believe this, sincerely. We're staying in ourselves. We KNOW what is happening to present business. We have three plants today... we had one before the war. We KNOW what will happen to future business. We have ourselves developed many of the new products... now held under wraps by military priorities... which will multiply it almost beyond imagination.

The dividends of foresight are BIG... will be even BIGGER. Let's collect them together!

PENGUIN PETE

P. S. For the biggest dividends of all... don't forget War Bonds!

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